```
=> d his

     (FILE 'HOME' ENTERED AT 12:39:38 ON 27 FEB 2004)

     FILE 'LREGISTRY' ENTERED AT 12:39:46 ON 27 FEB 2004
L1                STRUCTURE
L2             50 S L1 SSS SAM
L3                STRUCTURE

     FILE 'REGISTRY' ENTERED AT 12:53:11 ON 27 FEB 2004
L4             50 S L3 SSS SAM

     FILE 'LREGISTRY' ENTERED AT 12:56:28 ON 27 FEB 2004
L5                STRUCTURE

     FILE 'REGISTRY' ENTERED AT 12:59:55 ON 27 FEB 2004
L6             50 S L5 SSS SAM

     FILE 'LREGISTRY' ENTERED AT 13:17:45 ON 27 FEB 2004
L7                STRUCTURE

     FILE 'REGISTRY' ENTERED AT 13:19:53 ON 27 FEB 2004
L8                SCREEN 1992
L9                SCREEN 1840
L10            50 S L7 AND L9 NOT L8 SSS SAM

     FILE 'LREGISTRY' ENTERED AT 13:23:56 ON 27 FEB 2004
L11               STRUCTURE
L12               STRUCTURE

     FILE 'REGISTRY' ENTERED AT 13:38:18 ON 27 FEB 2004
L13             9 S L11 SSS SAM SUB=L10
L14            29 S L12 SSS SAM SUB=L10

     FILE 'LREGISTRY' ENTERED AT 13:40:36 ON 27 FEB 2004

     FILE 'REGISTRY' ENTERED AT 13:54:04 ON 27 FEB 2004
L15            50 S L7 AND L9 NOT L8 SSS SAM
L16         32366 S L7 AND L9 NOT L8 SSS FULL
                  SAVE L16 WEI143/A
L17            50 S L11 SSS SAM SUB=L16
L18            50 S L12 SSS SAM SUB=L16

     FILE 'LREGISTRY' ENTERED AT 14:05:46 ON 27 FEB 2004

     FILE 'REGISTRY' ENTERED AT 14:29:00 ON 27 FEB 2004
L19          7154 S L11 SSS FULL SUB=L16
                  SAVE L19 WEI143A/A
```

```
L20        18405 S L12 SSS FULL SUB=L16
                 SAVE L19 WEI143B/A

     FILE 'CAOLD' ENTERED AT 14:31:56 ON 27 FEB 2004
L21          481 S L19
L22         1630 S L20

     FILE 'HCAPLUS' ENTERED AT 14:34:20 ON 27 FEB 2004
L23        22610 S L19
L24        32130 S L20
L25         1363 S L23 AND L24
L26        53377 S L23 OR L24

     FILE 'LREGISTRY' ENTERED AT 14:37:19 ON 27 FEB 2004

     FILE 'HCAPLUS' ENTERED AT 14:40:47 ON 27 FEB 2004
L27       195444 S BATTERY OR BATTERIES OR (PRIMARY OR SECONDARY OR FUEL?
L28          228 S L26 AND L27
L29       526556 S (52 OR 72)/SC,SX
L30          129 S L28 AND L29
L31        48902 S SECONDARY (2A) (BATTERY OR BATTERIES)
L32           68 S L30 AND L31
L33           74 S L30 AND ELECTROLYT?
L34           27 S L33 NOT L32
L35           95 S L32 OR L34
L36           91 S L35 AND ((1907-2002)/PY OR (1907-2002)/PRY)
L37        37163 S NONAQUEOUS OR NON(W)AQUEOUS OR NONAQ# OR NONWATER? OR N
L38           14 S L36 AND L37
L39           36 S L36 AND CATHOD?
L40           27 S L39 NOT L38
L41           50 S L36 NOT (L38 OR L40)

     FILE 'LREGISTRY' ENTERED AT 14:53:32 ON 27 FEB 2004

     FILE 'HCAPLUS' ENTERED AT 14:59:14 ON 27 FEB 2004
                 SELECT L41 1-50 HIT RN

     FILE 'REGISTRY' ENTERED AT 15:00:29 ON 27 FEB 2004
L42           40 S E1-E40

     FILE 'LREGISTRY' ENTERED AT 15:01:13 ON 27 FEB 2004
L43             STR

     FILE 'REGISTRY' ENTERED AT 15:06:15 ON 27 FEB 2004
L44           50 S (L7 NOT L43) SSS SAM SUB=L16
L45        21886 S (L7 NOT L43) SSS FUL SUB=L16

     FILE 'HCAPLUS' ENTERED AT 15:08:03 ON 27 FEB 2004
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L46        36077 S L45
L47           34 S L41 NOT L46
                 SEL L47 1-34 HIT RN

     FILE 'REGISTRY' ENTERED AT 15:09:41 ON 27 FEB 2004
L48           24 S E41-E64

     FILE 'HCAPLUS' ENTERED AT 15:10:51 ON 27 FEB 2004
L49           16 S L41 AND L46
                 SEL L49 1-16 HIT RN

     FILE 'REGISTRY' ENTERED AT 15:11:38 ON 27 FEB 2004
L50           18 S E65-E82

     FILE 'HCAPLUS' ENTERED AT 15:14:39 ON 27 FEB 2004

     FILE 'REGISTRY' ENTERED AT 15:15:29 ON 27 FEB 2004
L51        15063 S (L19 OR L20) AND L45

     FILE 'HCAPLUS' ENTERED AT 15:16:39 ON 27 FEB 2004
L52        32327 S L51
L53          100 S L52 AND L27
L54           45 S L53 AND L29
L55           24 S L54 AND L31
L56           23 S L55 AND ((1907-2002)/PY OR (1907-2002)/PRY)
L57           12 S L56 NOT (L37 OR L40)
                 SEL L57 1-12 HIT RN

     FILE 'REGISTRY' ENTERED AT 15:19:25 ON 27 FEB 2004
L58           11 S E83-E93

     FILE 'HCAPLUS' ENTERED AT 15:21:02 ON 27 FEB 2004

=> d que stat l19
L7                 STR
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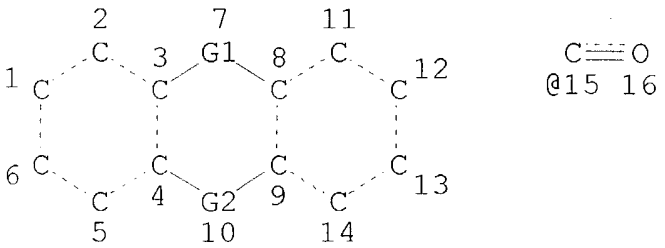


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VAR G1=O/S/15
REP G2=(0-2) C
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DEFAULT MLEVEL IS ATOM
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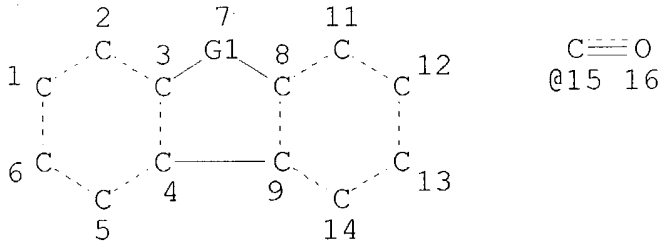
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 16

STEREO ATTRIBUTES: NONE
L8 SCR 1992
L9 SCR 1840
L11 STR



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DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE
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L19 7154 SEA FILE=REGISTRY SUB=L16 SSS FUL L11

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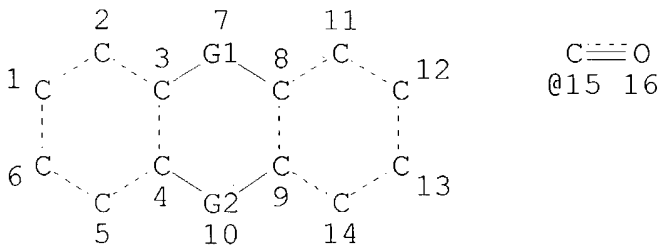
SEARCH TIME: 00.00.01

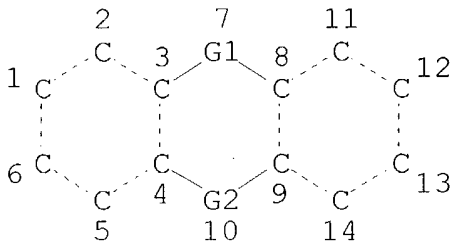
=> d que stat l20
L7 STR



VAR G1=O/S/15
REP G2=(0-2) C
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 16

STEREO ATTRIBUTES: NONE
L8 SCR 1992
L9 SCR 1840
L12 STR



C≡O @15 16 C≡C @17 @18 CH2 @19 CH2 CH2 @20 @21

VAR G1=O/S/15
VAR G2=19/17-4 18-9/20-4 21-9/15
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RSPEC I
NUMBER OF NODES IS 21

STEREO ATTRIBUTES: NONE
L16 32366 SEA FILE=REGISTRY SSS FUL L7 AND L9 NOT L8
L20 18405 SEA FILE=REGISTRY SUB=L16 SSS FUL L12

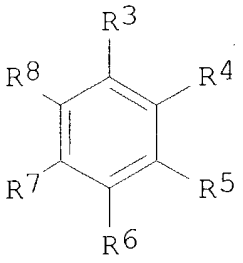
100.0% PROCESSED 31061 ITERATIONS 18405 ANSWERS
SEARCH TIME: 00.00.01

=> d l38 1-14 cbib abs hitstr hitind

L38 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
2003:815463 Document No. 139:326026 **Nonaqueous** electrolyte solution for Li **secondary battery.** Noda, Daisuke; Shizuka, Kenji; Kinoshita, Shinichi (Mitsubishi Chemical

Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2003297423 A2 20031017, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-100543 20020402.

GI



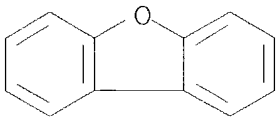
I

AB The invention relates to a **nonaq.** electrolyte soln. for a Li **secondary battery,** comprising: the sulfone compd. represented by SO2(R1)(R2) [R1 and R2 = aryl, and alkyl; R1 and R2 may be joined to form a ring structure]; and the arom. compd. with the mol. wt. ≤ 500 and represented by I [R3-8 = H, halo, C1-12 alkyl, C5-12 cycloalkyl, C6-12 aryl, and C11-14 arylcycloalkyl].

IT **132-64-9,** Dibenzofuran
(overcharging prevention agent; **nonaq.** electrolyte soln. for Li **secondary battery**)

RN 132-64-9 HCAPLUS

CN Dibenzofuran (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-58

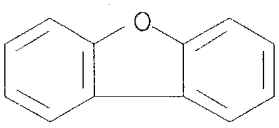
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST **nonaq** electrolyte soln lithium **secondary battery**

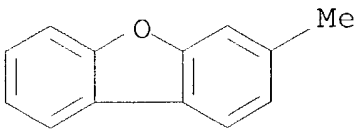
IT **Battery** electrolytes
Secondary batteries
(**nonaq.** electrolyte soln. for Li **secondary**

battery)
IT Sulfones
(**nonaq.** electrolyte soln. for Li **secondary battery**)
IT Electrolytes
(**nonaq.**; **nonaq.** electrolyte soln. for Li **secondary battery**)
IT 96-49-1, Ethylenecarbonate 105-58-8, Diethylcarbonate
(electrolyte soln.; **nonaq.** electrolyte soln. for Li **secondary battery**)
IT 21324-40-3, Lithium hexafluorophosphate (LiPF6)
(**nonaq.** electrolyte soln. for Li **secondary battery**)
IT 872-36-6, Vinylenecarbonate
(**nonaq.** electrolyte soln. for Li **secondary battery**)
IT 67-71-0, Dimethylsulfone **132-64-9**, Dibenzofuran
827-52-1, Cyclohexylbenzene
(overcharging prevention agent; **nonaq.** electrolyte soln. for Li **secondary battery**)

L38 ANSWER 2 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
2003:471075 Document No. 139:39153 **Secondary nonaqueous** electrolyte **battery.** Nishimura, Makiko; Kato, Kiyomi; Koshina, Shigeru; Okahara, Kenji; Shima, Noriko; Suzuki, Hitoshi (Matsushita Electric Industrial Co., Ltd., Japan; Mitsubishi Chemical Corp.). Jpn. Kokai Tokkyo Koho JP 2003173820 A2 20030620, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-272046 20020918. PRIORITY: JP 2001-302385 20010928.
AB The **battery** has a **nonaq.** electrolyte soln. and a stack of a Li intercalating anode, a separator, and a Li transition metal oxide cathode contg. Co, Ni, and/or Mn; where the electrode stack has a water content ≤50 ppm and the electrolyte soln. contains 0.2-5% biphenylene oxide and/or its deriv.
IT **132-64-9**, Diphenylene oxide **7320-52-7**
(electrolyte solns. contg. biphenylene oxide for **secondary** lithium **batteries**)
RN 132-64-9 HCAPLUS
CN Dibenzofuran (8CI, 9CI) (CA INDEX NAME)



RN 7320-52-7 HCAPLUS
CN Dibenzofuran, 3-methyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-58
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **secondary** lithium **battery** electrode separator water content; biphenylene oxide **secondary** lithium **battery** electrolyte soln
IT Carbonaceous materials (technological products)
(electrode-separator stacks with controlled water content for **secondary** lithium **batteries**)
IT **Battery** electrolytes
(electrolyte solns. contg. biphenylene oxide for **secondary** lithium **batteries**)
IT 9002-88-4, Polyethylene 12190-79-3, Cobalt lithium oxide (CoLiO2)
(electrode-separator stacks with controlled water content for **secondary** lithium **batteries**)
IT 7732-18-5, Water, miscellaneous
(electrode-separator stacks with controlled water content for **secondary** lithium **batteries**)
IT 96-49-1, Ethylene carbonate **132-64-9**, Diphenylene oxide 623-53-0, Ethyl methyl carbonate **7320-52-7** 21324-40-3, Lithium hexafluorophosphate
(electrolyte solns. contg. biphenylene oxide for **secondary** lithium **batteries**)

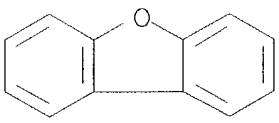
L38 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
2003:413938 Document No. 138:371789 **Nonaqueous** electrolyte composition for improving overcharge safety of lithium **battery**. Choy, Sang-Hoon; Kim, Ho-Sung; Sun, Hee-Young; Noh, Hyeong-Gon (Samsung SDI Co., Ltd., S. Korea). U.S. Pat. Appl. Publ. US 2003099886 A1 20030529, 10 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-270669 20021016. PRIORITY: KR 2001-64939 20011020.
AB Provided are a **nonaq.** electrolyte for improving **battery** safety by suppressing risks assocd. with the **battery** becoming overcharged as a result of certain uncontrolled conditions and a lithium **battery** with improved overcharge safety. The **nonaq.** electrolyte

includes an org. solvent, a lithium salt, and a biphenylene oxide based compd.

IT **132-64-9**, Dibenzofuran
(**nonaq.** electrolyte compn. for improving overcharge safety of lithium **battery**)

RN 132-64-9 HCAPLUS

CN Dibenzofuran (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40

NCL 429328000; 429200000; 429329000

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST safety improvement lithium **battery nonaq** electrolyte compn; biphenylene oxide additive electrolyte lithium **battery**

IT **Secondary batteries**
(lithium; **nonaq.** electrolyte compn. for improving overcharge safety of lithium **battery**)

IT **Battery** electrolytes
Safety
Swelling, physical
(**nonaq.** electrolyte compn. for improving overcharge safety of lithium **battery**)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 462-06-6, Fluorobenzene 623-53-0, Ethyl methyl carbonate 21324-40-3, Lithium hexafluorophosphate
(**nonaq.** electrolyte compn. for improving overcharge safety of lithium **battery**)

IT **132-64-9**, Dibenzofuran
(**nonaq.** electrolyte compn. for improving overcharge safety of lithium **battery**)

L38 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN

2002:962382 Document No. 138:58890 Electrolyte and **secondary battery.** Shizuka, Kenji; Okahara, Kenji; Shima, Kunihisa (Mitsubishi Chemical Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002367674 A2 **20021220**, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-175182 20010611.

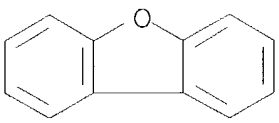
AB The electrolyte soln. has a Li salt dissolved in a solvent mixt. contg. ≥1 **nonaq.** solvent selected from carbonate esters, ethers and/or lactones; a dicarboxylate diester of the

formula R1O2(CH2)nO2R2 or R3O2(CH2)pCH:CH(CH2)qO2R4 (excluding succinate diesters) [R1-R4 = C1-10 alkyl or halogen substituted alkyl; n = an integer from 0-1 and 3-10; p and q = an integer from 0-5; and 0 ≤ (p+q) ≤ 10], or a deriv. thereof; and an arom. compd. of the formula C6R1R2R3R4R5R6 or R1OC6R2R3R4R5R6 [R1-R6 = H, halogen, C1-10 chain alkyl, C4-10 cyclic alkyl, or (substituted) phenyl], having mol. wt. ≤ 500. The **battery** has the above electrolyte soln., a cathode contg. a Li transition metal oxide, and a carbonaceous anode.

IT **132-64-9**, Dibenzofuran
(electrolyte solns. contg. dicarboxylate diesters and arom. compds. with controlled mol. wt. for **secondary** lithium **batteries**)

RN 132-64-9 HCAPLUS

CN Dibenzofuran (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-02; H01M004-58

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium **battery** electrolyte **nonaq** solvent additive dicarboxylate diester

IT **Battery** electrolytes
(electrolyte solns. contg. dicarboxylate diesters and arom. compds. with controlled mol. wt. for **secondary** lithium **batteries**)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 21324-40-3, Lithium hexafluorophosphate
(electrolyte solns. contg. dicarboxylate diesters and arom. compds. with controlled mol. wt. for **secondary** lithium **batteries**)

IT 95-92-1, Diethyl oxalate 108-59-8, Dimethyl malonate **132-64-9**, Dibenzofuran 872-36-6, Vinylene carbonate
(electrolyte solns. contg. dicarboxylate diesters and arom. compds. with controlled mol. wt. for **secondary** lithium **batteries**)

L38 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN

2002:354009 Document No. 136:372231 Electrolyte composition for **nonaqueous secondary battery** and solar photoelectrochemical cell. Ono, Michio; Wariishi, Koji; Yasuda,

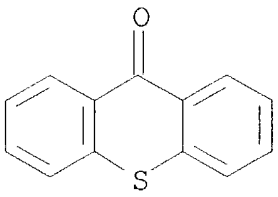
Takayasu; Qian, Chang-yi (Japan). U.S. Pat. Appl. Publ. US 2002055046 A1 **20020509**, 41 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-933716 20010822. PRIORITY: JP 2000-250828 20000822; JP 2001-248879 20010820.

AB An electrolyte compn. which is excellent in durability and charge transport performance, and an electrochem. **battery** in which deterioration of the charge transport performance with time is minimized are disclosed. The electrolyte compn. includes therein a salt which comprises an anion which contains a mesogen group, and an alkyl or alkenyl group having 6 carbons or more in the structure of the anion, and an org. or inorg. cation.

IT **100752-97-4**, Diethylthioxanthone
(sensitizer; electrolyte compn. for **nonaq. secondary battery** and solar photoelectrochem. cell)

RN 100752-97-4 HCAPLUS

CN 9H-Thioxanthen-9-one, diethyl- (9CI) (CA INDEX NAME)



2 (D1—Et)

IC ICM H01M010-40

NCL 429324000

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 74

ST solar photoelectrochem **nonaq** electrolyte; **battery secondary nonaq** electrolyte

IT **Battery** electrolytes
Electrolytes
Mesophase pitch
Photoelectrochemical cells
(electrolyte compn. for **nonaq. secondary battery** and solar photoelectrochem. cell)

IT Carbonaceous materials (technological products)
(electrolyte compn. for **nonaq. secondary battery** and solar photoelectrochem. cell)

IT **Secondary batteries**

(lithium; electrolyte compn. for **nonaq.** **secondary battery** and solar photoelectrochem. cell)

IT 26570-48-9, Viscoat 335
(crosslinking agent; electrolyte compn. for **nonaq.** **secondary battery** and solar photoelectrochem. cell)

IT 9002-93-1, Triton x 100
(dispersion agent; electrolyte compn. for **nonaq.** **secondary battery** and solar photoelectrochem. cell)

IT 311-28-4, Tetrabutylammonium iodide 1656-48-0 7553-56-2, Iodine, uses 12190-79-3, Cobalt lithium oxide colio2 13463-67-7, Titania, uses 174899-82-2 174899-83-3 307558-17-4 422555-55-3 422555-57-5 422555-59-7 422555-61-1 422555-63-3 422555-65-5 422555-67-7 422555-71-3 422555-73-5 422555-74-6 422555-76-8 422555-79-1 422555-80-4 422555-81-5 422555-82-6 422555-84-8 422555-85-9 422555-87-1 422555-88-2 422555-89-3 422555-91-7 422555-92-8 422555-93-9 423170-85-8 423171-91-9 423171-92-0 423171-95-3 423178-21-6
(electrolyte compn. for **nonaq.** **secondary battery** and solar photoelectrochem. cell)

IT 141460-19-7
(electrolyte compn. for **nonaq.** **secondary battery** and solar photoelectrochem. cell)

IT 75-05-8, Acetonitrile, uses
(electrolyte compn. for **nonaq.** **secondary battery** and solar photoelectrochem. cell)

IT 2589-57-3, Dimethyl 2,2'-azodiisobutyrate
(heat polymn. initiator; electrolyte compn. for **nonaq.** **secondary battery** and solar photoelectrochem. cell)

IT 71868-10-5, Irgacure 907
(light polymn. initiator; electrolyte compn. for **nonaq.** **secondary battery** and solar photoelectrochem. cell)

IT **100752-97-4**, Diethylthioxanthone
(sensitizer; electrolyte compn. for **nonaq.** **secondary battery** and solar photoelectrochem. cell)

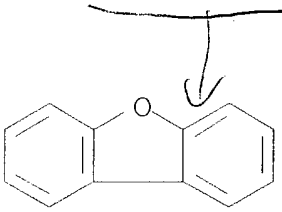
L38 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
2001:932814 Document No. 136:56423 **Secondary** lithium **battery.** Shimizu, Takehiro; Kuratomi, Itaru; Tatsumi, Kuniaki; Sakai, Tetsuo (Nippon Steel Chemical Co., Ltd., Japan; Sangyo Gijutsu Sogo Kenkyusho). Jpn. Kokai Tokkyo Koho JP ~~2001357876 A2 2001~~1226, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-177052 20000613.

AB The **battery** has a Li compd. cathode, a Li intercalating anode, a separator, and a **nonaq.** Li salt electrolyte soln. contg. 1-10% of an arom. overcharge inhibitor; where a stainless steel electrode and a Li electrode, with a glass separator in between, shows max. current densities ≤5 μA/cm2 and ≥25 μA/cm2, at 4.0-4.2V and 4.5-4.7V, resp., when scanned at 5 mV/s between 3.0-5.0V in a 1M LiPF6/1:1 (vol.) ethylene carbonate-di-Me carbonate soln. contg. 2% of the inhibitor. The inhibitor is selected from naphthalene, benzyl biphenyl, and diphenylene oxide.

IT **132-64-9**, Diphenylene oxide
(arom. overcharge inhibitors in electrolyte solns. for **secondary** lithium **batteries**)

RN 132-64-9 HCAPLUS

CN Dibenzofuran (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS G01N027-416

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST arom overcharge inhibitor **secondary** lithium **battery**; naphthalene overcharge inhibitor **secondary** lithium **battery**; benzyl biphenyl overcharge inhibitor **secondary** lithium **battery**; phenylene oxide overcharge inhibitor **secondary** lithium **battery**

IT **Battery** electrolytes
(electrolyte solns. contg. arom. overcharge inhibitors for **secondary** lithium **batteries**)

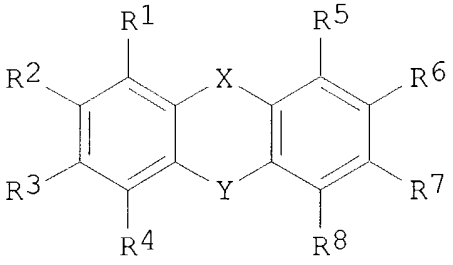
IT 91-20-3, Naphthalene, uses 92-52-4, Biphenyl, uses **132-64-9**, Diphenylene oxide 606-97-3, o-Benzyl biphenyl 613-42-3, p-Benzyl biphenyl 790-22-7
(arom. overcharge inhibitors in electrolyte solns. for **secondary** lithium **batteries**)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 21324-40-3, Lithium hexafluorophosphate
(electrolyte solns. contg. arom. overcharge inhibitors for **secondary** lithium **batteries**)

L38 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
2001:868874 Document No. 136:9102 **Nonaqueous** electrolyte solution and **secondary battery** using the

solution. Okahara, Kenji; Shima, Noriko; Suzuki, Hitoshi (Mitsubishi Chemical Corporation, Japan). PCT Int. Appl. WO 2001091223 A1 **20011129**, 22 pp. DESIGNATED STATES: W: AE, AG, AL, AU, BA, BB, BG, BR, BZ, CA, CN, CO, CR, CU, CZ, DM, DZ, EE, GD, GE, HR, HU, ID, IL, IN, IS, KR, LC, LK, LR, LT, LV, MA, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TT, UA, US, UZ, VN, YU, ZA, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2001-JP4406 20010525. PRIORITY: JP 2000-155772 20000526.

GI



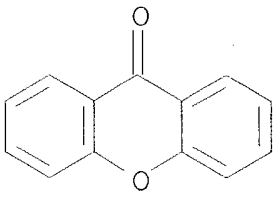
I

AB The electrolyte soln. contains an org. solvent, a Li salt, and I, where X = -O-, -S-, -CO-, or -SO2-; Y = single bond, -CH2-, -CH2CH2-, -CH:CH-, or -CO-, but not both X and Y = -CO- at the same time; R1-8 = H, alkyl, Ph, halogen group. The **battery** is a **secondary** Li **battery.**

IT **90-47-1**, Xanthone **132-64-9**, Dibenzofuran **1210-35-1**, Dibenzosuberone **2222-33-5**, Dibenzosuberenone
(multi-ring arom. additives in **nonaq.** electrolyte solns. for **secondary** lithium **batteries**)

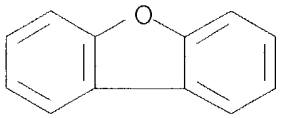
RN 90-47-1 HCAPLUS

CN 9H-Xanthen-9-one (9CI) (CA INDEX NAME)

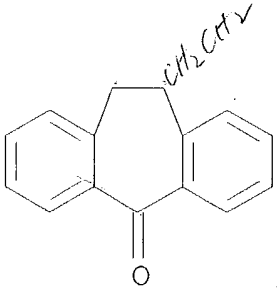


RN 132-64-9 HCAPLUS

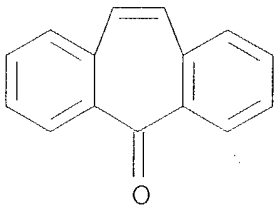
CN Dibenzofuran (8CI, 9CI) (CA INDEX NAME)



RN 1210-35-1 HCAPLUS
CN 5H-Dibenzo[a,d]cyclohepten-5-one, 10,11-dihydro- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 2222-33-5 HCAPLUS
CN 5H-Dibenzo[a,d]cyclohepten-5-one (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-62; H01M004-02; C07D307-91; C07D311-86; C07D335-12
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **secondary** lithium **battery** electrolyte soln arom additive
IT **Battery** electrolytes
(multi-ring arom. additives in **nonaq.** electrolyte solns. for **secondary** lithium **batteries**)
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 21324-40-3, Lithium hexafluorophosphate
(multi-ring arom. additives in **nonaq.** electrolyte solns. for **secondary** lithium **batteries**)

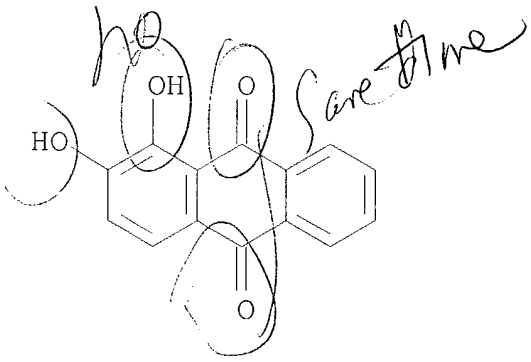
IT **90-47-1**, Xanthone **132-64-9**, Dibenzofuran **1210-35-1**, Dibenzosuberone **2222-33-5**, Dibenzosuberenone
(multi-ring arom. additives in **nonaq.** electrolyte solns. for **secondary** lithium **batteries**)

L38 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
2000:49105 Document No. 132:95787 **Nonaqueous** electrolyte **secondary battery.** Maijima, Toshikazu; Nakai, Kenji (Shin-Kobe Electric Machinery Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000021444 A2 **20000121**, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-185148 19980630.

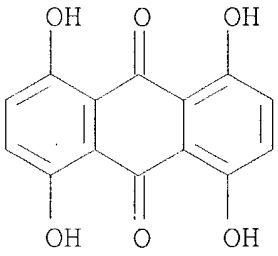
AB The **battery** comprises a spinel-structured Li manganate cathode active material and **nonaq.** electrolytes contg. ≥1 compds. selected from quinones and quinone analogs. The **batteries** show long cycle life at high temp.

IT **72-48-0**, Alizarine **81-60-7**, 1,4,5,8-Tetrahydroxyanthraquinone **84-48-0**, Anthraquinone-2-sulfonic acid **84-54-8**, 2-Methylanthraquinone **84-65-1**, Anthraquinone **131-09-9**, 2-Chloroanthraquinone
(**secondary batteries** with **nonaq.** electrolytes contg. quinones)

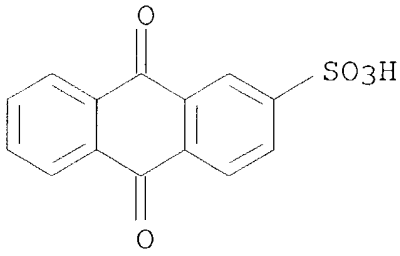
RN 72-48-0 HCAPLUS
CN 9,10-Anthracenedione, 1,2-dihydroxy- (9CI) (CA INDEX NAME)



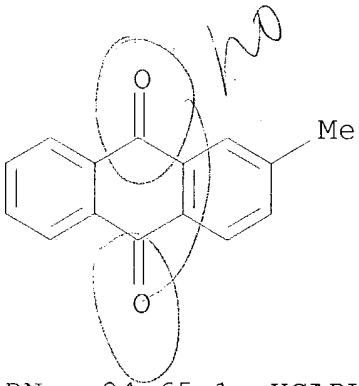
RN 81-60-7 HCAPLUS
CN 9,10-Anthracenedione, 1,4,5,8-tetrahydroxy- (9CI) (CA INDEX NAME)



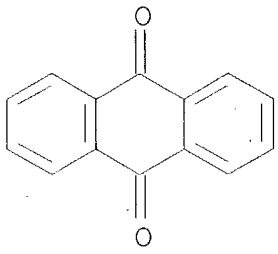
RN 84-48-0 HCAPLUS
CN 2-Anthracenesulfonic acid, 9,10-dihydro-9,10-dioxo- (8CI, 9CI) (CA INDEX NAME)



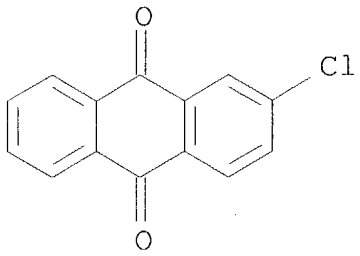
RN 84-54-8 HCAPLUS
CN 9,10-Anthracenedione, 2-methyl- (9CI) (CA INDEX NAME)



RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



RN 131-09-9 HCAPLUS
CN 9,10-Anthracenedione, 2-chloro- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-58
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **nonaq** electrolyte **secondary battery** quinone additive
IT **Secondary batteries**
(lithium; **secondary batteries** with **nonaq.** electrolytes contg. quinones)
IT **Battery** electrolytes
(**secondary batteries** with **nonaq.** electrolytes contg. quinones)
IT Hydroquinones
Quinones
(**secondary batteries** with **nonaq.** electrolytes contg. quinones)
IT 12057-17-9, Lithium manganese oxide (LiMn2O4)
(cathode active material; **secondary batteries** with **nonaq.** electrolytes contg. quinones)
IT 58-27-5, 2-Methyl-1,4-naphthoquinone **72-48-0**, Alizarine **81-60-7**, 1,4,5,8-Tetrahydroxyanthraquinone **84-48-0**, Anthraquinone-2-sulfonic acid **84-54-8**, 2-Methylanthraquinone 84-58-2, 2,3-Dichloro-5,6-dicyano-p-

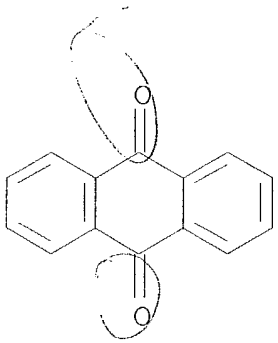
benzoquinone **84-65-1**, Anthraquinone 87-66-1, Pyrogallol 95-71-6, Methyl-p-hydroquinone 106-51-4, p-Benzoquinone, uses 117-79-3, 2-Aminoanthraquinone 118-75-2, p-Chloranil, uses 130-15-4, 1,4-Naphthoquinone **131-09-9**, 2-Chloroanthraquinone 131-14-6, 2,6-Diaminoanthraquinone 363-03-1, Phenyl-p-benzoquinone 475-38-7, 5,8-Dihydroxy-1,4-naphthoquinone 524-42-5, 1,2-Naphthoquinone 527-17-3, Tetramethyl-p-benzoquinone 527-21-9, Tetrafluoro-p-benzoquinone 553-97-9, Methyl-p-benzoquinone 571-60-8, 1,4-Dihydroxynaphthalene 574-00-5, 1,2-Dihydroxynaphthalene 581-43-1, 2,6-Dihydroxynaphthalene 583-63-1, o-Benzoquinone 613-20-7, 2,6-Naphthoquinone 615-94-1, 2,5-Dihydroxy-p-benzoquinone 695-99-8, Chloro-p-benzoquinone 697-91-6, 2,6-Dichloro-p-benzoquinone 719-22-2, 2,6-Di(tert-butyl)-1,4-benzoquinone 1010-60-2, 2-Chloro-1,4-naphthoquinone 2348-82-5, 2-Methoxy-1,4-naphthoquinone 2435-53-2, o-Chloranil 3117-03-1, 2,5-Dimethoxy-p-benzoquinone 3131-54-2, 4-Methyl-o-benzoquinone 3383-21-9, 3,5-Di(tert-butyl)-o-benzoquinone 3958-83-6 5460-35-5, 4-Amino-1,2-naphthoquinone 7477-57-8, 4-Methyl-1,2-naphthoquinone 18916-57-9, 4-Methoxy-1,2-naphthoquinone 19643-45-9, 2,6-Dibromo-p-benzoquinone 24229-89-8, 4-Dimethylamino-1,2-naphthoquinone 71127-64-5, 6-Bromo-1,4-naphthoquinone 83575-14-8
(**secondary batteries** with **nonaq.** electrolytes contg. quinones)

L38 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
1995:991031 Document No. 124:69833 Quinone synthesized from an aromatic compound in an undivided **electrochemical cell**. Chou, Tse Chuan; Lee, An Cheng (National Science Council, Taiwan). U.S. US 5466346 A **19951114**, 7 pp. (English). CODEN: USXXAM. APPLICATION: US 1994-236639 19940502.

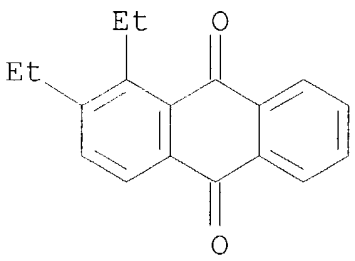
AB A method for synthesizing quinone from an arom. compd. is developed that employs a paired electrooxidn. method and a undivided **electrochem. cell**. The **electrolyte** soln. is a combination of an arom. soln. (aq. or **nonaq.**) and a redox mediator soln., which can be V5/V4, Fe3/Fe2, or Cu2/Cu+, in an undivided **electrochem. cell**. The **electrolyte** reaction is conducted by bubbling oxygen into the bottom of the cathode, then the oxygen is reduced to hydrogen peroxide (H2O2). Simultaneously, at the anode surface, lower valence state ions can be oxidized to higher valence states. Hydrogen peroxide then oxidizes the rest of the low valence state ions to form high valence ions, OH-free radicals, and combinations of both. These ions and radicals then react with the arom. compd. in the soln. and form the resultant product, quinone.

IT **84-65-1P**, Anthraquinone
(electrochem. synthesis of anthraquinone from anthracene)

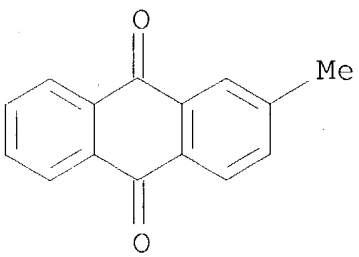
RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



IT **20724-30-5P**, 1,2-Diethylanthraquinone
(electrochem. synthesis of diethylanthraquinone from diethylanthracene)
RN 20724-30-5 HCAPLUS
CN 9,10-Anthracenedione, 1,2-diethyl- (9CI) (CA INDEX NAME)



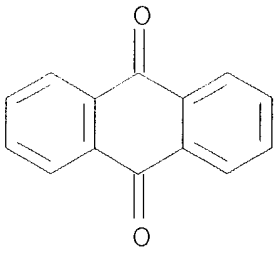
IT **84-54-8P**, 2-Methylanthraquinone
(electrochem. synthesis of methylanthraquinone from methylanthracene)
RN 84-54-8 HCAPLUS
CN 9,10-Anthracenedione, 2-methyl- (9CI) (CA INDEX NAME)



IC ICM C25B003-00
ICS C25B003-02
NCL 204072000
CC **72-4** (Electrochemistry)
Section cross-reference(s): 25
ST quinone synthesis arom compd; undivided **electrochem cell** quinone synthesis
IT **84-65-1P**, Anthraquinone
(electrochem. synthesis of anthraquinone from anthracene)
IT **20724-30-5P**, 1,2-Diethylanthraquinone
(electrochem. synthesis of diethylanthraquinone from diethylanthracene)
IT **84-54-8P**, 2-Methylanthraquinone
(electrochem. synthesis of methylanthraquinone from methylanthracene)
IT 106-51-4P, Quinone, preparation
(quinone synthesized from arom. compd. in undivided **electrochem. cell**)
IT 7440-50-8, Copper, uses
(quinone synthesized from arom. compd. in undivided **electrochem. cell** contg. bath contg. Cu2+/Cu+)
IT 7439-89-6, Iron, uses
(quinone synthesized from arom. compd. in undivided **electrochem. cell** contg. bath contg. Fe3+/Fe2+)
IT 7440-62-2, Vanadium, uses
(quinone synthesized from arom. compd. in undivided **electrochem. cell** contg. bath contg. V5+/V4+)

L38 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
1994:439109 Document No. 121:39109 Graphite intercalation compounds as positives in rechargeable metal-free **batteries**. Beck, Fritz; Boinowitz, Tammo; Krohn, Holger; Tormin, Ulf; Ther, Eduard (Fachgebiet Elektrochemie, Univ. Duisburg, Duisburg, D-47048, Germany). Molecular Crystals and Liquid Crystals Science and Technology, Section A: Molecular Crystals and Liquid Crystals, 245, 177-82 (English) **1994**. CODEN: MCLCE9. ISSN: 1058-725X.
AB Two essentially metal-free rechargeable **batteries** with graphite intercalation compd. as cathode and org. materials as anode are described. One **battery** contains an anthraquinone/carbon black anode and aq. 8M HBF4 electrolyte. The other is a **nonaq.** system of 0.2M LiClO4 in propylene carbonate, with polypyrrole layer on carbon black-filled polypropylene as anode. Cycling tests of **battery** prototypes at c.d. of 3 and 0.5 mA/cm2 were carried out.
IT **84-65-1**, Anthraquinone
(anodes contg. carbon black and, metal-free **battery** with graphite intercalation cathode and)
RN 84-65-1 HCAPLUS

CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **72**, 78

ST graphite intercalation cathode metal free **battery**; polypyrrole polypropylene anode **battery**; anthraquinone carbon black anode **battery**

IT Carbon black, uses
(anodes contg. anthraquinone and, metal-free **battery** with graphite intercalation cathode and)

IT **Batteries, secondary**
(metal-free, graphite intercalation/org. material, characteristics of)

IT Anodes
(**battery**, anthraquinone/carbon black and polypyrrole/polypropylene, in metal-free **battery**)

IT Cathodes
(**battery**, graphite intercalation compds., in metal-free **battery**)

IT **84-65-1**, Anthraquinone
(anodes contg. carbon black and, metal-free **battery** with graphite intercalation cathode and)

IT 30604-81-0, Polypyrrole
(anodes contg. polypropylene and, metal-free **battery** with graphite intercalation cathode and)

IT 9003-07-0, Polypropylene
(anodes contg. polypyrrole and, metal-free **battery** with graphite intercalation cathode and)

IT 7782-42-5D, Graphite, intercalation compds.
(cathodes, in metal-free **battery** with anthraquinone/carbon or polypropylene/polypyrrole cathode)

IT 108-32-7, Propylene carbonate
(electrolyte contg. lithium perchlorate and, metal-free **battery** with graphite intercalation cathode and org. material anode and and)

IT 7791-03-9, Lithium perchlorate (LiClO4)

(electrolyte contg. propylene carbonate and, metal-free **battery** with graphite intercalation cathode and org. material anode and)

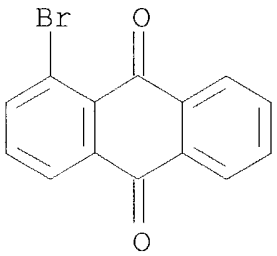
IT 16872-11-0, Fluoroboric acid (HBF4)
(electrolyte of aq., metal-free **battery** with graphite intercalation cathode and org. material anode and)

L38 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
1989:447068 Document No. 111:47068 Construction of an optically transparent thin-layer-electrode cell for use with oxygen-sensitive species in aqueous and **nonaqueous** solvents. Pilkington, Matthew B. G.; Coles, Barry A.; Compton, Richard G. (Phys. Chem. Lab., Oxford Univ., Oxford, OX1 3QZ, UK). Analytical Chemistry, 61(15), 1787-9 (English) **1989**. CODEN: ANCHAM. ISSN: 0003-2700.

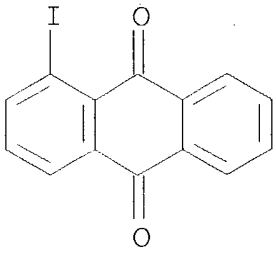
AB An optically transparent thin layer electrode cell is described and evaluated. Current transients are recorded via potential steps for a model 1 electron reversible redox couple in MeCN with background **electrolyte**. The redn. produces changes in absorption at sep. wavelengths over the range of 250 to 650 nm. Absorption transients at a fixed wavelength are recorded in parallel with the current transients. IR expts. are also possible. The **cell** meets **electrochem.** requirements for excluding O, and is easily and rapidly constructed with min. edge effects. Std. parts are used with no workshop facilities required for the construction of a well-characterized spectroelectrochem. system.

IT **121176-25-8P 121176-26-9P**
(formation of, electrochem. reductive, thin-layer spectroelectrochem. cell for)

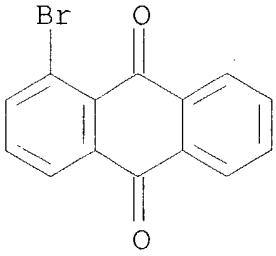
RN 121176-25-8 HCAPLUS
CN 9,10-Anthracenedione, 1-bromo-, radical ion(1-) (9CI) (CA INDEX NAME)



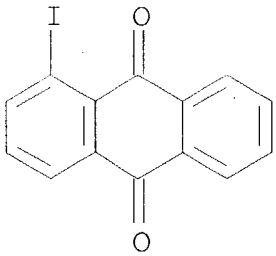
RN 121176-26-9 HCAPLUS
CN 9,10-Anthracenedione, 1-iodo-, radical ion(1-) (9CI) (CA INDEX NAME)



IT **632-83-7**
(redn. of, electrochem., thin-layer spectroelectrochem. cell for)
RN 632-83-7 HCAPLUS
CN 9,10-Anthracenedione, 1-bromo- (9CI) (CA INDEX NAME)



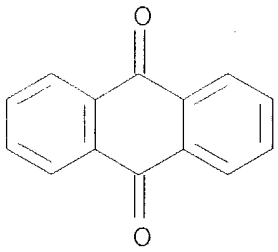
IT **3485-80-1**
(redn. of, thin-layer spectroelectrochem. cell for)
RN 3485-80-1 HCAPLUS
CN 9,10-Anthracenedione, 1-iodo- (9CI) (CA INDEX NAME)



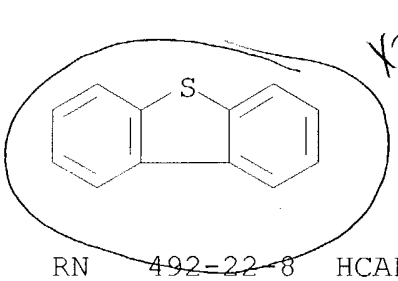
CC **72-2** (Electrochemistry)
Section cross-reference(s): 22, 73
IT Redox reaction
(**electrochem.**, spectroelectrochem. **cell** for study of)

IT **Electrolytic** cells
(spectrochem., thin-layer, for oxygen-sensitive species in aq. and **nonaq.** solns.)
IT **121176-25-8P 121176-26-9P**
(formation of, electrochem. reductive, thin-layer spectroelectrochem. cell for)
IT **632-83-7**
(redn. of, electrochem., thin-layer spectroelectrochem. cell for)
IT **3485-80-1**
(redn. of, thin-layer spectroelectrochem. cell for)

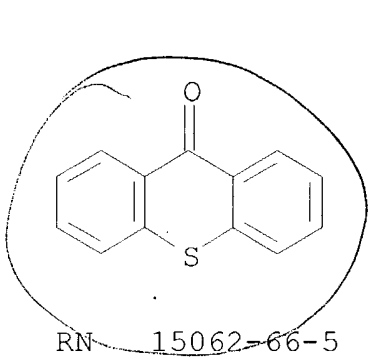
L38 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
1989:118363 Document No. 110:118363 **Nonaqueous battery.** Yoshimitsu, Kazumi; Sekido, Shintaro; Kazehara, Kenya; Kajita, Kozo; Manabe, Toshikatsu (Hitachi Maxell, Ltd., Japan). Eur. Pat. Appl. EP 296589 A2 **19881228**, 18 pp. DESIGNATED STATES: R: DE, FR, GB. (English). CODEN: EPXXDW. APPLICATION: EP 1988-110028 19880623. PRIORITY: JP 1987-156948 19870624; JP 1987-218435 19870831.
AB The **battery** comprises an alkali metal anode, a porous carbonaceous cathode collector, and a catholyte of an ionically conductive soln. of a solute in a solvent contg. a liq. oxyhalide. The **electrolyte** and/or the collector contains resp. 10-6-10-2M (or 0.05-20%) arom. compd. The arom. compd. is a carboxylic compd. having ≥2 benzene rings (naphthalene, anthracene, pyrene, 1,2-benzanthracene, perylene, pentacene, triphenylene, benz[a]pyrene, 1,2,3,4-dibenzanthracene, 1,2,5,6-dibenzanthracene, benz[ghi]perylene, coronene) or an O- or S-contg. compd. having a benzene ring connected to an O- or S-contg. ring (2,6-di-tert-Bu-1,4-benzoquinone, 1,8-naphthalic anhydride, 9,10-anthraquinone, dibenzothiophene, benzothiophene, 4-phenylthiophene, thiochroman-4-one, thioxanthen-9-one). The arom. compds. are chlorinated. Thus, catholytes contg. 1.2M LiAlCl4 and 7 + 10-4M of 1 of the claimed arom. compds. were used in Li-SOCl2 **batteries.** The voltages of these **batteries** on discharge through a 10-Ω load for 50 ms at 20° were 1.502-2.149 V, vs. 1.189 V for a **battery** without the org. compd.
IT **84-65-1**, 9,10-Anthraquinone **132-65-0**, Dibenzothiophene **492-22-8**, Thioxanthen-9-one **15062-66-5**, 2,3,6,7-Tetrachloroanthraquinone **119493-82-2**, 2,4,7-Trichlorodibenzothiophene
(catholyte contg., lithium-thionyl chloride **battery**, for decreasing initial voltage drop)
RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



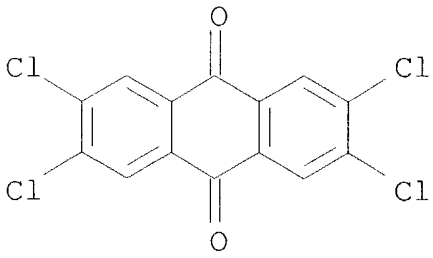
RN 132-65-0 HCAPLUS
CN Dibenzothiophene (8CI, 9CI) (CA INDEX NAME)



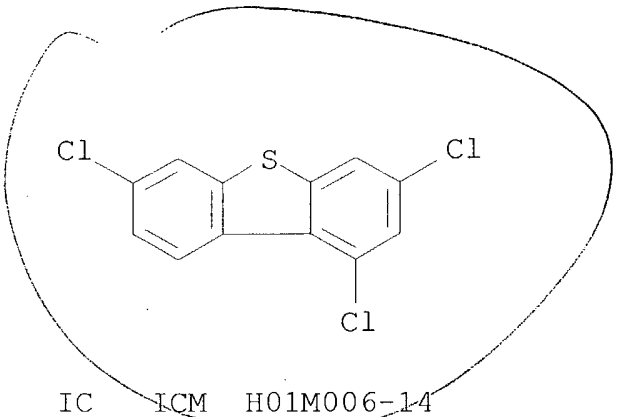
RN 492-22-8 HCAPLUS
CN 9H-Thioxanthen-9-one (9CI) (CA INDEX NAME)



RN 15062-66-5 HCAPLUS
CN 9,10-Anthracenedione, 2,3,6,7-tetrachloro- (9CI) (CA INDEX NAME)



RN 119493-82-2 HCAPLUS
CN Dibenzothiophene, 1,3,7-trichloro- (9CI) (CA INDEX NAME)



IC ICM H01M006-14
ICS H01M004-66
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium thionyl chloride **battery**; arom additive lithium **nonaq battery**
IT **Batteries**, primary
(lithium-thionyl chloride, with **nonaq. electrolyte** contg. arom. additive)
IT Cathodes
(**battery**, thionyl chloride, carbonaceous current collector for, arom. additive-contg.)
IT 50-32-8, Benzo[a]pyrene, uses and miscellaneous 53-70-3, 1,2,5,6-Dibenzanthracene 56-55-3, 1,2-Benzanthracene 198-55-0, Perylene
(cathode current collector contg., thionyl chloride, for decreasing initial voltage drop of **nonaq. batteries**)
IT 81-84-5, 1,8-Naphthalic anhydride **84-65-1**, 9,10-Anthraquinone 91-20-3, Naphthalene, uses and miscellaneous 92-24-0, 2,3-Benzanthracene 95-15-8, Benzothiophene 117-08-8 120-12-7, Anthracene, uses and miscellaneous 129-00-0, Pyrene, uses and miscellaneous **132-65-0**, Dibenzothiophene 135-48-8, Pentacene 191-07-1, Coronene 215-58-7, 1,2,3,4-Dibenzanthracene **492-22-8**, Thioxanthen-9-one 719-22-2 825-55-8 3528-17-4, Thiochroman-4-one 7061-81-6 **15062-66-5**, 2,3,6,7-Tetrachloroanthraquinone 119493-81-1, 2,4,6-Trichlorobenzothiophene **119493-82-2**, 2,4,7-Trichlorodibenzothiophene
(catholyte contg., lithium-thionyl chloride **battery**, for decreasing initial voltage drop)

L38 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
1982:43111 Document No. 96:43111 Lightweight **battery**.
Tobishima, Shinichi; Yamaki, Junichi; Yamaji, Akihiko (Nippon Telegraph and Telephone Public Corp., Japan). Fr. Demande FR 2472277 A1 **19810626**, 31 pp. (French). CODEN: FRXXBL.
APPLICATION: FR 1980-26844 19801217. PRIORITY: JP 1979-163621

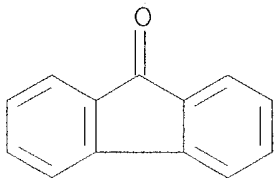
19791218; JP 1979-163622 19791218; JP 1979-163623 19791218; JP 1980-3801 19800117; JP 1980-21575 19800225.

AB A **battery** (primary or **secondary**) was developed in which the anode contains an active material from the Group IA of the Periodic Table, the cathode has an active material chosen from a group of org. compds. having a conjugated system of π electrons, and an electrolyte from a material which does not react chem. with the anode or cathode and permits the migration of ions from the anode to the cathode. For example, a **battery** is made having a Li anode, a porous polypropylene separator, and a cathode prepd. by mixing 2,4,7-trinitro-9-fluorenone [129-79-3] and acetylene black powder with an electrolyte of 1M LiClO4 dissolved in propylene carbonate. Such a **battery** can be discharge at 1.57 mA for 59 h until the voltage has fallen to 1 V. The energy d. of the **battery** is 2.940 W-h/kg.

IT **486-25-9**
(cathode active material, with acetylene black for light wt. **battery**)

RN 486-25-9 HCAPLUS

CN 9H-Fluoren-9-one (9CI) (CA INDEX NAME)



IC H01M010-36; H01M006-14

CC **72-3** (Electrochemistry)

ST primary **secondary battery nonaq** electrolyte

IT Carbon black, uses and miscellaneous
(cathode from trinitrofluorenone and, for light wt. **battery**)

IT **Batteries**, primary
Batteries, secondary
(lightwt.)

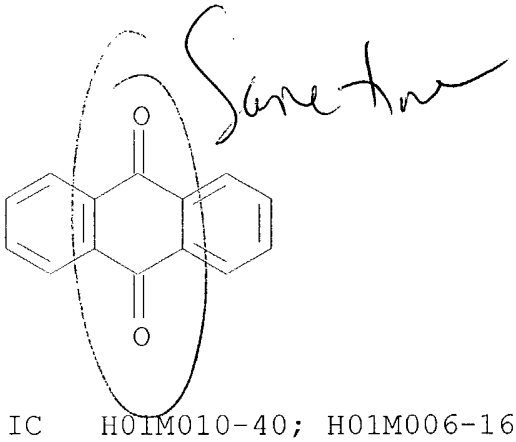
IT 7439-93-2, uses and miscellaneous
(anode, for light wt. **battery**)

IT 7440-50-8D, cupferron complex
(cathode active material, with acetylene black for light wt. **battery**)

IT 66-71-7 83-72-7 84-11-7 85-02-9 135-20-6 135-20-6D, copper complex 230-27-3 **486-25-9** 10210-64-7 14024-18-1 14024-48-7 14710-63-5 21679-46-9 29204-93-1 32982-03-9

80420-02-6 80430-48-4
(cathode active material, with acetylene black for light wt. **battery**)
IT 121-90-4 122-04-3 479-45-8 612-24-8 619-24-9 619-72-7
746-53-2 1083-48-3 1144-74-7 2338-12-7 10380-28-6
14323-17-2
(cathode active material, with carbon black for light wt. **battery**)
IT 129-79-3
(cathode from acetylene black and, for light wt. **battery**)
IT 108-32-7
(electrolyte from lithium perchlorate and, for light wt. **battery**)
IT 110-71-4
(electrolyte from lithium perchlorate in propylene carbonate and, for light wt. **battery**)
IT 7791-03-9
(electrolyte, in propylene carbonate for light wt. **battery**)
IT 9003-07-0
(separator, for light wt. **battery**)

L38 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2004 ACS on STN
1980:429118 Document No. 93:29118 Rechargeable lithium **battery** element. Fritz, Heinz P.; Besenhard, Juergen (Rheinisch-Westfaelisches Elektrizitaetswerk A.-G., Fed. Rep. Ger.). Ger. Offen. DE 2834485 **19800214**, 21 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1978-2834485 19780807.
AB Secondary **nonaq.**-electrolyte Li **batteries** are disclosed. Thus, Li-Al alloy-Cr oxide and Li-Al alloy - Tl **batteries** were prepd. and their characteristics were detd. The resp. **battery** electrolytes were LiClO4 and TlBr in propylene carbonate. Paraffin oils and anthraquinone [**84-65-1**] were used as inhibitors in these **batteries**, and SOCl2 or SO2Cl2 was used as inner drying agent.
IT **84-65-1**
(inhibitors, lithium **nonaq.**-electrolyte **battery** contg.)
RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



IC H01M010-40; H01M006-16; H01M004-40; H01M004-06
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium **nonaq** electrolyte **battery**
IT Paraffin oils
(inhibitors, lithium **nonaq**.-electrolyte **battery** contg.)
IT **Batteries, secondary**
(lithium, **nonaq**.-electrolyte)
IT 12615-39-3
(anodes, in **nonaq**.-electrolyte **batteries**)
IT 7440-28-0, uses and miscellaneous 11118-57-3
(cathodes, in **nonaq**.-electrolyte **battery** with aluminum-lithium alloy anode)
IT 7719-09-7 7791-25-5
(drying agents, lithium **nonaq**.-electrolyte **battery** contg.)
IT **84-65-1**
(inhibitors, lithium **nonaq**.-electrolyte **battery** contg.)

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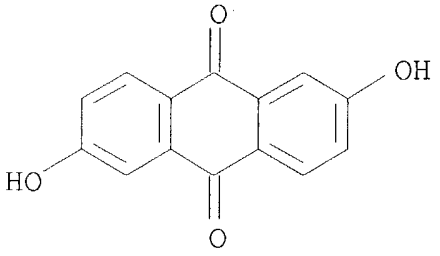
L40 ANSWER 1 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
2003:77190 Document No. 138:114047 Electrochemical synthesis of hydrogen peroxide. Gopal, Ramanathan (The Electrosynthesis Company, Inc., USA). U.S. Pat. Appl. Publ. US 2003019758 A1 20030130, 17 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-199719 20020719. PRIORITY: US 2001-PV307293 20010722.
AB Improved methods and devices for the synthesis of hydrogen peroxide employing redox catalysts in a gas diffusion electrode or membrane electrode assembly in a semi-chem./electrochem. system for the prodn. of high purity, stable, usually acidic, aq. solns. of peroxide at high conversion efficiencies without requiring org. solvents.
IT **84-60-6**, Anthraflavic acid

(use in prepn. of electrode for membrane **electrolytic cell** in **electrochem.** synthesis of hydrogen peroxide using electrocatalyst)

RN 84-60-6 HCAPLUS
CN 9,10-Anthracenedione, 2,6-dihydroxy- (9CI) (CA INDEX NAME)



IC ICM C25B001-30
ICS C25B011-00; C25D017-12; C25B011-03; C25C007-02; C25D017-00; C25B009-00; C25C007-00
NCL 205466000; 204284000; 205468000; 204283000; 204252000
CC **72-9** (Electrochemistry)
Section cross-reference(s): 47, 49, 67
ST hydrogen peroxide **electrochem** prodn membrane **cell** electrocatalyst
IT Reduction, electrochemical
(**cathodic**, of oxygen in **electrolytically** conductive reaction medium, for hydrogen peroxide prodn.)
IT Catalysis
(electrocatalysis; electrochem. synthesis of hydrogen peroxide using electrocatalyst in membrane **electrolytic** cell)
IT Redox reaction catalysts
(electrochem. synthesis of hydrogen peroxide using electrocatalyst in membrane **electrolytic** cell)
IT Carbon black, uses
(electrode in electrochem. synthesis of hydrogen peroxide using electrocatalyst in membrane **electrolytic** cell)
IT Carbon fibers, uses
(fabrics, hydrophobic; use in prepn. of electrode for membrane **electrolytic cell** in **electrochem.** synthesis of hydrogen peroxide using electrocatalyst)
IT Current density
Current efficiency
(for electrochem. synthesis of hydrogen peroxide using electrocatalyst in membrane **electrolytic** cell)
IT **Electrolytic cells**
(membrane; **electrochem.** prodn. of hydrogen peroxide in)
IT 7440-44-0, Carbon, uses

(activated; electrode in electrochem. synthesis of hydrogen peroxide using electrocatalyst in membrane **electrolytic** cell)

IT 7782-44-7, Oxygen, reactions
(**cathodic** redn. of, in **electrolytically** conductive reaction medium, for hydrogen peroxide prodn.)

IT 7664-93-9, Sulfuric acid and, uses
(**electrolyte** in electrochem. prodn. of hydrogen peroxide)

IT 7722-84-1, Hydrogen peroxide, processes
(prodn. of, by **cathodic** redn. of oxygen in **electrolytically** conductive reaction medium)

IT 50-00-0, Formaldehyde, uses **84-60-6**, Anthraflavic acid 103-33-3, Azobenzene 123-31-9, Hydroquinone, uses 29323-86-2
(use in prepn. of electrode for membrane **electrolytic cell** in **electrochem.** synthesis of hydrogen peroxide using electrocatalyst)

L40 ANSWER 2 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

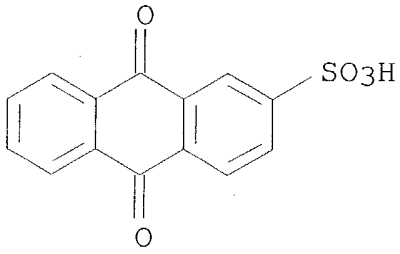
2002:253396 Document No. 136:281968 **Secondary battery**, electrochemistry capacitor, and their manufacture. Nakagawa, Yuji; Nishiyama, Toshihiko; Kamito, Hiroyuki; Harada, Manabu; Kurosaki, Masato (Nec Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002100398 A2 **20020405**, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-285910 20000920.

AB The **battery** and the capacitor have ≥2 electrodes, contg. a powd. active mass mixed with a conductor and an org. binder, separator(s) between the electrodes, and an aq. electrolyte soln. contg. a dissolved quinone type compd. The **battery** and capacitor are prepd. by using redoxable conducting polymer **cathode** and a redoxable conducting polymer anodes, by holding a separator between the electrodes, and injecting a quinone type compd. contg. aq. electrolyte soln. in the electrode-separator body.

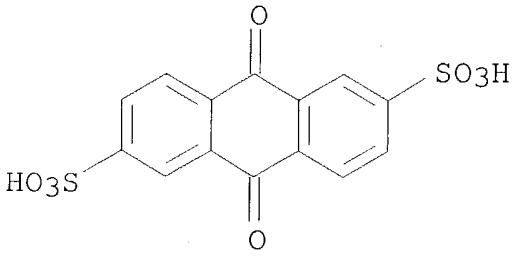
IT **84-48-0**, Anthraquinone-2-sulfonic acid **84-50-4**, Anthraquinone-2,6-disulfonic acid **14395-08-5**, Anthraquinone-1,7-disulfonic acid
(aq. electrolyte solns contg. quinone derivs. for **batteries** with redoxable polymer electrodes)

RN 84-48-0 HCAPLUS

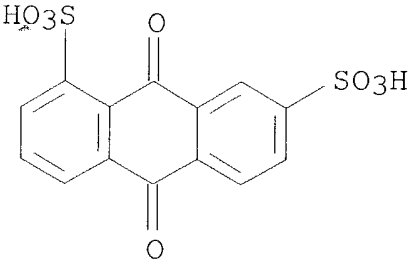
CN 2-Anthracenesulfonic acid, 9,10-dihydro-9,10-dioxo- (8CI, 9CI) (CA INDEX NAME)



RN 84-50-4 HCAPLUS
CN 2,6-Anthracenedisulfonic acid, 9,10-dihydro-9,10-dioxo- (7CI, 8CI, 9CI) (CA INDEX NAME)



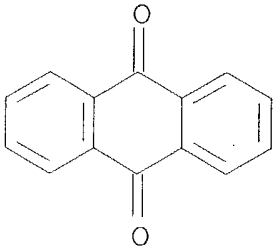
RN 14395-08-5 HCAPLUS
CN 1,7-Anthracenedisulfonic acid, 9,10-dihydro-9,10-dioxo- (7CI, 8CI, 9CI) (CA INDEX NAME)



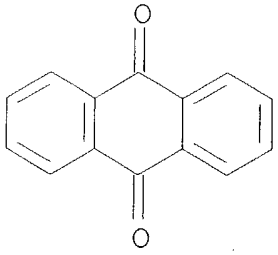
IC ICM H01M010-36
ICS H01G009-038; H01G009-058; H01G009-22; H01G009-00
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
ST **secondary battery** aq electrolyte quinone deriv; capacitor aq electrolyte quinone deriv

IT **Battery** electrolytes
(aq. electrolyte solns contg. quinone derivs. for **batteries** with redoxable polymer electrodes)
IT Polyquinoxalines
(polyphenylquinoxalines; anodes in **secondary batteries** with quinone derive. contg. aq. electrolyte solns.)
IT **Secondary batteries**
(**secondary batteries** with redoxable electrodes and quinone deriv. contg. aq. electrolyte solns.)
IT **84-48-0**, Anthraquinone-2-sulfonic acid **84-50-4**, Anthraquinone-2,6-disulfonic acid 106-51-4, p-Benzoquinone, uses 2435-53-2, o-Chloranil 7664-93-9, Sulfuric acid, uses **14395-08-5**, Anthraquinone-1,7-disulfonic acid
(aq. electrolyte solns contg. quinone derivs. for **batteries** with redoxable polymer electrodes)
IT 91201-84-2
(**cathodes** in **secondary batteries** with quinone derive. contg. aq. electrolyte solns.)

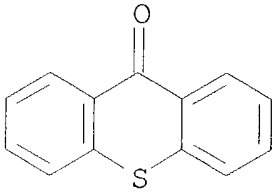
L40 ANSWER 3 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
2001:915360 Document No. 136:8993 **Electrochemical cell** having a solid state **electrolyte**. (E.C.R. - Electro-Chemical Research Ltd., Israel). Israeli IL 117233 A1 **20000629**, 54 pp. (English). CODEN: ISXXAQ. APPLICATION: IL 1996-117233 19960222.
AB A **battery** comprises an anode, a **cathode**, and a solid state **electrolyte** between, and in contact with, the anode and **cathode**, wherein: (a) the anode includes a material which includes a metal whose cation can assume at least two different non-zero oxidn. nos.; (b) the **cathode** includes a compd. which forms an electrochem. **battery** couple with the above anode; and (c) the **electrolyte** includes a solid in which protons are mobile.
IT **84-65-1**, Anthraquinone **84-65-1D**, Anthraquinone, alkyl derivs. **492-22-8**, Thioxanthen-9-one
(**electrochem. cell** having solid state **electrolyte**)
RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



RN 492-22-8 HCAPLUS
CN 9H-Thioxanthen-9-one (9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-60
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **72**
ST **battery** solid state **electrolyte**
IT Adsorbents
(anion; **electrochem. cell** having solid state **electrolyte**)
IT Anion exchangers
Battery electrolytes

Cation exchangers
Primary batteries
(**electrochem. cell** having solid state **electrolyte**)

IT Fullerenes
Heteropoly acids
Transition metal oxides
(**electrochem. cell** having solid state **electrolyte**)

IT Carbon black, uses
(**electrochem. cell** having solid state **electrolyte**)

IT Chalcogenides
(metal; **electrochem. cell** having solid state **electrolyte**)

IT Polysulfones, uses
(sulfonated; **electrochem. cell** having solid state **electrolyte**)

IT Heteropoly acids
(tungstophosphoric; **electrochem. cell** having solid state **electrolyte**)

IT 108-80-5, Cyanuric acid
(anhyd.; **electrochem. cell** having solid state **electrolyte**)

IT 7440-05-3, Palladium, uses
(**electrochem. cell** having solid state **electrolyte**)

IT 51-28-5, 2,4-Dinitrophenol, uses 67-52-7, Barbituric acid 69-93-2, Uric acid, uses 77-79-2, 3-Sulfolene 84-58-2, 2,3-Dichloro-5,6-dicyano-1,4-benzoquinone **84-65-1**, Anthraquinone **84-65-1D**, Anthraquinone, alkyl derivs. 87-88-7, Chloranilic acid 87-90-1, Trichlorocyanuric acid 88-89-1, Picric acid 91-20-3, Naphthalene, uses 99-65-0, m-Dinitrobenzene 103-90-2, Acetaminophen 104-91-6, 4-Nitrosophenol 105-11-3, p-Quinonedioxime 108-30-5, Succinic anhydride, uses 108-77-0, Cyanuric chloride 118-52-5, 1,3-Dichloro-5,5-dimethyl hydantoin 118-76-3, Rhodizonic acid 118-76-3D, Rhodizonic acid, alkali metal salts 120-89-8, Parabanic acid 123-31-9, Hydroquinone, uses 123-56-8, Succinimide 128-09-6, n-Chlorosuccinimide 149-32-6, meso-Erythritol 319-89-1, Tetrahydroxyquinone 461-72-3, Hydantoin **492-22-8**, Thioxanthen-9-one 526-99-8, Mucic acid 527-17-3, Duroquinone 527-31-1, Triquinoyl 556-90-1, Pseudothiohydantoin 608-80-0, Hexahydroxybenzene 611-08-5, 5-Nitrouracil 637-88-7D, Tetrahydroquinone, alkali metal salts 873-83-6, 6-Amino uracil 1004-38-2, 2,4,6-Triaminopyrimidine 1121-89-7, Glutarimide 1301-96-8, Silver oxide ago 1304-76-3, Bismuth oxide bi2o3, uses 1313-13-9, Manganese dioxide, uses 1313-27-5, Molybdenum trioxide,

uses 1314-35-8, Tungsten trioxide, uses 1317-38-0, Copper oxide cuo, uses 2244-21-5, Potassium Dichloro isocyanurate 2295-31-0, 2,4-Thiazolidine dione 2428-04-8, Hexachloromelamine 2782-57-2, Dichloro isocyanuric acid 2892-51-5, Squaric acid 2893-78-9, Sodium Dichloro isocyanurate 3617-57-0, Leuconic acid 4202-74-8, Glycine anhydride 5103-42-4, Hydrindantin 5144-89-8, o-Phenanthroline monohydrate 6713-54-8 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-47-3, Chromium, uses 7440-50-8, Copper, uses 7673-09-8, Trichloromelamine 7785-87-7, Manganese sulfate mnso4 9002-88-4D, Polyethylene, chlorosulfonated 9003-53-6D, Polystyrene, sulfonated 9004-35-7, Cellulose acetate 9012-09-3, Cellulose triacetate 11104-88-4, Molybdophosphoric acid 12026-04-9, Nickel hydroxide oxide niooh 12034-78-5, Niobium triselenide 12054-48-7, Nickel hydroxide 16917-04-7, Lithium Dichloro isocyanurate 20667-12-3, Silver oxide ag2o 27297-64-9, Dehydro ascorbic acid dimer 59763-75-6, Tantalum oxide 109064-29-1, Barium copper yttrium oxide Ba2Cu3YO7 113924-17-7D, Bismuth copper strontium oxide Bi2CuSr2O6, O-excess 115866-34-7D, Bismuth calcium copper strontium oxide Bi2CaCu2Sr2O8, O-excess
(**electrochem. cell** having solid state **electrolyte**)

IT 57-11-4, Stearic acid, uses 7782-42-5, Graphite, uses 9003-39-8, Povidone 9005-25-8, Starch, uses
(**electrochem. cell** having solid state **electrolyte**)

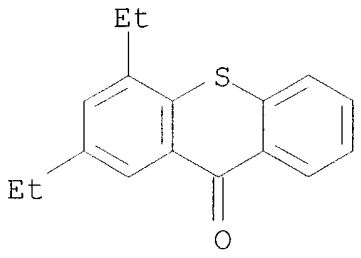
L40 ANSWER 4 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

2001:692192 Document No. 135:244997 Polymer-electrolyte element, polymer-electrolyte element roll, its manufacture, and manufacture of **secondary** lithium **battery**. Amanokura, Hitoshi; Sonobe, Hiroyuki; Uehara, Hideaki (Hitachi Chemical Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001256826 A2 **20010921**, 15 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-65552 20000309.

AB The element comprise a polymer-electrolyte layer contg. (A) a resin, (D) an electrolyte soln., and optionally (B) a polymg. compd. having ≥1 ethylenic unsatd. bond and/or (C) a photopolymn. initiator or thermal polymn. initiator formed by coating on a support and optionally light or electron beam irradiated or heated. The element roll is manufd. by coiling the above element to give a roll. Resulting roll is also claimed. Claimed **battery** is manufd. by laminating and adhering the above polymer electrolye element on an anode material or a **cathode** material. The element has good thickness uniformity to give a lightwt. **battery**.

IT **82799-44-8**, Kayacure DETX
(polymn. catalyst; polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)

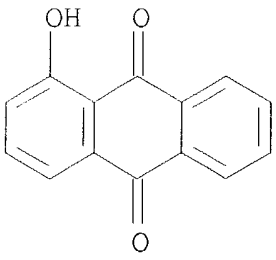
RN 82799-44-8 HCAPLUS
CN 9H-Thioxanthen-9-one, 2,4-diethyl- (9CI) (CA INDEX NAME)



IC ICM H01B001-06
ICS C08F002-44; C08F002-50; C08F291-00; C08K003-00; C08K005-00; C08L101-00; H01M006-18; H01M010-40
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
ST polymer electrolyte **battery** manuf
IT **Secondary batteries**
(lithium; polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)
IT Polymerization catalysts
(photopolymn.; polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)
IT Polysiloxanes, uses
(polyamide-polyoxyalkylene-, block; polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)
IT Polyoxyalkylenes, uses
(polyamide-polysiloxane-, block; polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)
IT **Battery** electrolytes
Polymer electrolytes
(polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)
IT Polyamides, uses
(polyoxyalkylene-polysiloxane-, block; polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)
IT 7439-93-2D, Lithium, polymer complexes, uses 361161-24-2D, lithium complexes 361161-25-3D, lithium complexes 361161-26-4D, lithium complexes 361161-27-5D, lithium complexes
(electrolytes; polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)

IT 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate
(polymer complexes, electrolytes; polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)
IT 90-93-7, EAB 119-61-9, Kayacure BP, uses 24650-42-8, Irgacure 651 71868-10-5, Irgacure 907 **82799-44-8**, Kayacure DETX
(polymn. catalyst; polymer electrolyte element and manuf. of its roll for **secondary** lithium **battery**)

L40 ANSWER 5 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
2000:181242 Document No. 132:210237 **Battery** electrodes, **secondary batteries**, and their manufacture.
Fujiwara, Masaki; Harada, Manabu; Okada, Shinako; Nishiyama, Toshihiko (NEC Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2000082467 A2 **20000321**, 12 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1998-250254 19980904.
AB The electrodes contain ≥1 org. polymer and a carbonaceous conductive aid, where the polymer absorbs and releases H+ by an electrochem. redox reaction. The **batteries** may use the electrodes as **cathodes** and/or anodes. The **batteries** are prepd. by drying a soln. contg. the polymer and the carbonaceous powder and molding the dried mixt.
IT **129-43-1**, 1-Hydroxyanthraquinone
(proton sources for **batteries** with electrodes contg. electrochem. redox-able polymers)
RN 129-43-1 HCAPLUS
CN 9,10-Anthracenedione, 1-hydroxy- (9CI) (CA INDEX NAME)



IC ICM H01M004-60
ICS H01M004-02; H01M010-40
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** electrode electrochem redoxable polymer
IT **Battery** electrodes
(electrodes contg. electrochem. redox-able polymers and carbonaceous conductive aids for **secondary**

batteries)
IT Carbonaceous materials (technological products)
(electrodes contg. electrochem. redox-able polymers and carbonaceous conductive aids for **secondary batteries**)
IT Polyoxyalkylenes, uses
(fluorine- and sulfo-contg., ionomers; electrolytes for **secondary batteries** with electrochem. redox-able polymer electrodes)
IT Polyoxyalkylenes, uses
(fluorine-contg., sulfo-contg., ionomers; electrolytes for **secondary batteries** with electrochem. redox-able polymer electrodes)
IT Fluoropolymers, uses
Fluoropolymers, uses
(polyoxyalkylene-, sulfo-contg., ionomers; electrolytes for **secondary batteries** with electrochem. redox-able polymer electrodes)
IT Ionomers
(polyoxyalkylenes, fluorine- and sulfo-contg.; electrolytes for **secondary batteries** with electrochem. redox-able polymer electrodes)
IT **Secondary batteries**
(**secondary batteries** with electrodes contg. electrochem. redox-able polymers and proton sources)
IT 25013-01-8, Polypyridine 190201-51-5
(anodes contg. electrochem. redox-able polymers and carbonaceous conductive aids for **secondary batteries**)
IT 25233-30-1D, Polyaniline, sulfonate 26101-52-0D, Poly(vinylsulfonic acid), salts with polyaniline 121220-41-5, Polyaniline p-toluenesulfonate
(**cathodes** contg. electrochem. redox-able polymers and carbonaceous conductive aids for **secondary batteries**)
IT 16872-11-0 26101-52-0, Poly(vinylsulfonic acid)
(proton source electrolytes for **batteries** with electrodes contg. electrochem. redox-able polymers)
IT **129-43-1**, 1-Hydroxyanthraquinone
(proton sources for **batteries** with electrodes contg. electrochem. redox-able polymers)

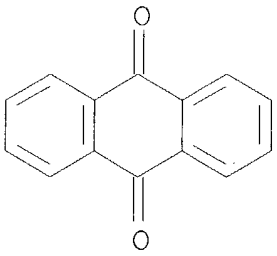
L40 ANSWER 6 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1999:665442 Document No. 131:260021 Polymer **batteries**.
Okada, Shinako; Nishiyama, Toshihiko; Harada, Manabu; Fujiwara, Masaki (NEC Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11288740 A2 **19991019** Heisei, 9 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1998-90174 19980402.
AB The **batteries** use **cathodes** contg. reduced

polyaniline or its deriv., reduced p-doped conducting polymer having a conjugated π bond system or its deriv., benzoquinone or its deriv., or a reduced form of a org. compds. or polymers capable of releasing or receiving electrons by an electrochem. redox reaction; and anodes composed of oxidized polypyridine, polypyridine or its deriv., oxidized n-doped conducting polymer having a conjugated π bond system or its deriv., anthraquinone or its deriv., or an oxidized form of a org. compds. or polymers capable of releasing or receiving electrons by an electrochem. redox reaction; and are charged by const. current charging.

IT **84-65-1**, Anthraquinone
(anodes for **secondary** polymer **batteries**)

RN 84-65-1 HCAPLUS

CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



IC ICM H01M010-40
ICS H01M004-02; H01M004-60; H01M010-36

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** conducting polymer electrode

IT Polyanilines
(**cathodes** for **secondary** polymer **batteries**)

IT **Secondary batteries**
(electrodes for **secondary** polymer **batteries**)

IT **84-65-1**, Anthraquinone 25013-01-8, Polypyridine
(anodes for **secondary** polymer **batteries**)

IT 106-51-4, 2,5-Cyclohexadiene-1,4-dione, uses 25233-30-1, Polyaniline
(**cathodes** for **secondary** polymer **batteries**)

IT 104-15-4, p-Toluenesulfonic acid, uses 69444-47-9
(electrolyte compns. for **batteries** with **secondary** polymer electrodes)

L40 ANSWER 7 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1999:375783 Document No. 131:47161 Redox and electrically conducting

polyquinoid and related polymers for use as **cathode** materials in electrochemical generators, especially lithium **batteries**. Armand, Michel; Michot, Christophe; Ravet, Nathalie (Acep Inc., Can.; Centre National de la Recherche Scientifique (CNRS); Universite de Montreal). PCT Int. Appl. WO 9928984 A1 **19990610**, 37 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (French). CODEN: PIXXD2. APPLICATION: WO 1998-CA1125 19981202. PRIORITY: CA 1997-2223562 19971202.

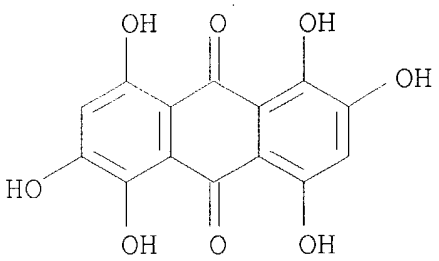
AB Redox compns., composed of redox polymers and conducting polymers, having at least one oxidn. state, for use as electrode materials, esp. for lithium **batteries**, are of general structure [R2-(C(=X))p-q-R1-[Z]q-R3-]n . 2p M+, in which: (1) M+ is an alkali metal, alk. earth metal, transition metal, or rare earth metal cation, organometallic cation, an org. cation, a repeating unit of an oxidized conjugated cationic polymer, or a cation formed from monomeric or polymeric units (e.g., with addnl. redox character), (2) X = O, NCN, or C(CN)2, (3) Z = CY- or N- (Y = O, S, NCN, C(CN)2; and Y =S≥4 when X = O), (3) R = absent, O, S, NH2, -(C.tplbond.C)r, -(W=W)r (W = CR6or N; r = 1-12; R6 = H, halogen, CN, C1-12-alkyl, C2-12-alkenyl, or C6-14-aryl, possibly substituted by oxa, aza, or thia); (4) R2 and R3 are absent or a divalent hydrocarbyl, optionally substituted by aza, oxa, or thia; and (5) q = 0-p; p = 1-5; n = 1-104. The novel electrode materials are esp. derived from polyquinoid ionic compds. Suitable compds. include rhodizonic acid salts; 1,2,4,5,6,8-hexahydroxyanthraquinone salts; ellagic acid salts; thiocyanic acid polymers or poly(1-cyano-2-mercaptoacetylene); polymers contg. the units derived from ketopyridines; an alternating polymer contg. benzoquinone and pyrazine units; dithiosquaric acid salts; 1,5-dihydropyrimido(5,4d)pyrimidine-2,4,6,8(3H,7H)-tetrone acid salts; a dicarboxylic acid salt in which the groups are linked by conjugated bonds; and polyamides derived from a dicarboxylic acid in which the groups are linked by conjugated bonds. The polymers can be partially reduced.

IT **61169-36-6DP**, 9,10-Anthracenedione, 1,2,4,5,6,8-hexahydroxy-, salts
(**cathodes**; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)

RN 61169-36-6 HCAPLUS

CN 9,10-Anthracenedione, 1,2,4,5,6,8-hexahydroxy- (9CI) (CA INDEX

NAME)



IC ICM H01M004-60
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST lithium **battery cathode** redox conducting polymer; polyquinoid lithium **battery cathode**; polyamide redox lithium **battery cathode**; reduced redox polymer **battery cathode**
IT Amides, uses
Fluoropolymers, uses
Polyethers, uses
(electrolytes contg.; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)
IT Primary **batteries**
Secondary batteries
(lithium; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)
IT Transition metal salts
(mixed nitrates, anodes; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)
IT Oxidation
(of redox polymers; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)
IT **Battery cathodes**
(redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**
)
IT Polyamides, uses
(redox-type; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)

IT 7439-93-2, Lithium, uses 12057-24-8, Lithium oxide, uses 227322-25-0, Lithium titanium oxide (Li1-2Ti1.75-2O4)
(anodes; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)

IT 68231-39-0
(**cathodes**; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)

IT 144-62-7DP, Oxalic acid, salts 319-89-1DP, 2,5-Cyclohexadiene-1,4-dione, 2,3,5,6-tetrahydroxy-, salts 476-66-4DP, Ellagic acid, salts 488-86-8DP, 4-Cyclopentene-1,2,3-trione, 4,5-dihydroxy, salts 504-89-2DP, Diazenedicarboxylic acid, salts 13021-40-4P, 5-Cyclohexene-1,2,3,4-tetrone, 5,6-dihydroxy-, dipotassium salt 13568-33-7DP, Lithium nitrite, reaction products with carbon monoxide-ethylene alternating copolymer 32337-43-2P, 5-Cyclohexene-1,2,3,4-tetrone, 5,6-dihydroxy-, dilithium salt 52094-54-9P, Poly[imino(1,2-dioxo-1,2-ethanediyl)imino-1,4-phenylene] 52427-61-9P, Dipotassium dithiosquarate **61169-36-6DP**, 9,10-Anthracenedione, 1,2,4,5,6,8-hexahydroxy-, salts 73727-57-8P, Dimethyl oxalate-1,4-phenylenediamine copolymer 111190-67-1DP, Ethene, polymer with carbon monoxide, alternating, reaction products with lithium nitrite 121242-09-9P, 1,2,3,4-Cyclohexanetetrone, 5,6-dihydroxy- 227322-06-7P 227322-07-8P 227322-08-9P 227322-09-0P 227322-10-3DP, reduced 227322-12-5DP, oxidized 227322-12-5P 227322-13-6P 227322-14-7P 227322-15-8P 227322-18-1DP, reduced 227322-18-1P 227322-20-5P 227322-21-6P 227322-22-7P 227322-23-8DP, salts, oxidized
(**cathodes**; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)

IT 52094-54-9DP, Poly[imino(1,2-dioxo-1,2-ethanediyl)imino-1,4-phenylene], oxidized 227322-11-4P
(**cathodes**; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)

IT 96-48-0 107-21-1D, Ethylene glycol, dialkyl ethers 111-46-6D, Diethylene glycol, dialkyl ethers 112-27-6D, Triethylene glycol, dialkyl ethers 112-60-7D, Tetraethylene glycol, dialkyl ethers 463-79-6D, Carbonic acid, esters, uses 7803-58-9D, Sulfamide, tetraalkyl derivs. 9011-14-7, Poly(methyl methacrylate) 24937-79-9 25014-41-9, Polyacrylonitrile
(electrolytes contg.; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)

IT 7697-37-2, Nitric acid, uses
(lithium-transition metal mixed salts, anodes; redox and elec. conducting polyquinoid and related polymers for use as

cathode materials in lithium **batteries**)

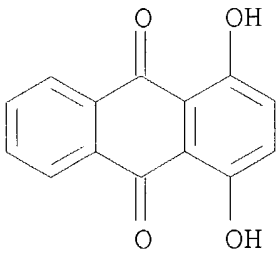
IT 2712-78-9, Bis(trifluoroacetoxy)iodobenzene
(oxidizing agent; redox and elec. conducting polyquinoid and related polymers for use as **cathode** materials in lithium **batteries**)

L40 ANSWER 8 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1999:157757 Document No. 130:184816 Electrochemical properties of chloranilic acid and its application to the anode material of alkaline **secondary batteries**. Osaka, Tetsuya; Momma, Toshiyuki; Komoda, Satoru; Shiraishi, Nobuhiro; Kikuyama, Susumu; Yuasaa, Kohji (School of Science and Engineering, Waseda University, Okubo, Shinjuku, Tokyo, 169-8555, Japan). Electrochemistry (Tokyo), 67(3), 238-242 (Japanese) **1999**. CODEN: EECTFA. ISSN: 1344-3542. Publisher: Electrochemical Society of Japan.

AB For alk. **batteries**, it is important to investigate prospective materials with higher energy d. and lower cost. We paid attention to the reaction of quinone compds. and investigated the electrochem. properties of these compds. in alk. soln. and discussed the possibility for a neg. active material of alk. **secondary batteries**. In alk. soln., most of these materials, e.g. p-benzoquinone, dissolved, while only chloranilic acid (C6Cl2(OH)2O2) did not. We have found that chloranilic acid is the most possible candidate for the neg. active materials of alk. **batteries** because of its insoly. to alk. solns. There were three couples of peaks in cyclic voltammogram (-1.2 .apprx.-0.1V vs. Ag/AgCl) for the electrode of chloranilic acid. With **cathodic** scan of cyclic voltammogram on -0.8 V vs. Ag/AgCl, the color of soln. changed. It seems that this change is caused by the influence of dissolved products, which was formed by electrochem. redox reaction of chloranilic acid around -1.0 V vs. Ag/AgCl. When the charge-discharge test was conducted in the potential range between -0.45 V and -0.8 V, no colored substance was formed in the soln. and the discharge capacity reached to approx. 150 mAh g-1 at the first cycle. From these results, on chloranilic acid, it was suggested that there was a possibility of application for a neg. active material of alk. **secondary batteries**.

IT **81-64-1**, Quinizarin
(electrochem. properties of chloranilic acid and its application to anode material of alk. **secondary batteries**)

RN 81-64-1 HCAPLUS
CN 9,10-Anthracenedione, 1,4-dihydroxy- (9CI) (CA INDEX NAME)



CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **72**
ST chloranilic acid anode material **battery**
IT **Battery** anodes
Secondary batteries
(electrochem. properties of chloranilic acid and its application to anode material of alk. **secondary batteries**
)
IT Redox reaction
(electrochem.; electrochem. properties of chloranilic acid and its application to anode material of alk. **secondary batteries**)
IT 87-88-7, Chloranilic acid
(electrochem. properties of chloranilic acid and its application to anode material of alk. **secondary batteries**
)
IT **81-64-1**, Quinizarin 106-51-4, p-Benzoquinone, properties 319-89-1, Tetrahydroxy-p-benzoquinone 527-21-9, Tetrafluoro-p-benzoquinone
(electrochem. properties of chloranilic acid and its application to anode material of alk. **secondary batteries**
)

L40 ANSWER 9 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1999:140005 Document No. 130:174418 Electrosynthesis of hydroxylammonium salts and hydroxylamine using a mediator, a catalytic film, methods of making the catalytic film, and electrosynthesis of compounds using the catalytic film. Sharifian, Hossein; Wagenknecht, John H.; Bard, Allen J. (Sachem, Inc., USA). PCT Int. Appl. WO 9909234 A2 **19990225**, 60 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE,

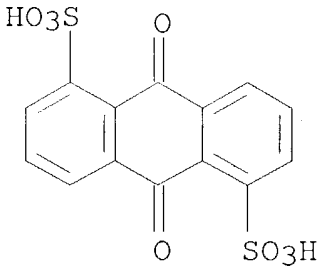
IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US16942 19980814. PRIORITY: US 1997-55823 19970815.

AB In one embodiment, the present invention relates to a method of making a catalytic film comprising: applying an elec. current to an **electrochem. cell** comprising an anode, a **cathode** and a soln. comprising a film forming compd. and a nitrate ion source thereby forming the catalytic film. In another embodiment, the present invention relates to a method of prepg. a hydroxylammonium salt, involving the steps of: providing an **electrochem. cell** contg. an anode, a **cathode**, and a divider positioned between the anode and the **cathode**, to define a catholyte compartment between the **cathode** and the divider and an anolyte compartment between the anode and the divider; charging the catholyte compartment with a first soln. comprising a nitrogen contg. compd. and a mediator and the anolyte compartment with a second soln. comprising an ionic compd.; passing a current through the **electrochem. cell** to produce a hydroxylammonium salt in the catholyte compartment; and recovering the hydroxylammonium salt from the catholyte compartment.

IT **853-35-0D**, Anthraquinone-1,5-disulfonic acid disodium salt, sodium salt **853-68-9**, Anthraquinone-2,6-disulfonic acid disodium salt
(formation of catalytic film for electrosynthesis of hydroxylammonium salts and hydroxylamine)

RN 853-35-0 HCAPLUS

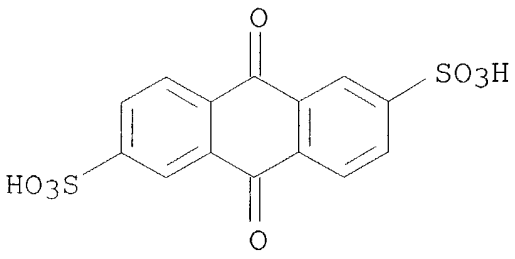
CN 1,5-Anthracenedisulfonic acid, 9,10-dihydro-9,10-dioxo-, disodium salt (7CI, 8CI, 9CI) (CA INDEX NAME)



●2 Na

RN 853-68-9 HCAPLUS

CN 2,6-Anthracenedisulfonic acid, 9,10-dihydro-9,10-dioxo-, disodium salt (7CI, 8CI, 9CI) (CA INDEX NAME)



●2 Na

IC ICM C25B001-00
CC **72-9** (Electrochemistry)
Section cross-reference(s): 67
IT Membranes, nonbiological
(bipolar; use in **electrolytic** cell for hydroxylammonium salts and hydroxylamine using a mediator and catalytic film)
IT **Electrolytic** cells
(for hydroxylammonium salts and hydroxylamine using a mediator and catalytic film)
IT Electric current
(in **electrolytic** cell for electrosynthesis of hydroxylammonium salts and hydroxylamine using a mediator and catalytic film)
IT Ion exchange membranes
(use in **electrolytic** cell for hydroxylammonium salts and hydroxylamine using a mediator and catalytic film)
IT 7440-32-6, Titanium, uses
(RuO2 coated; anode in **electrolytic** cell for electrosynthesis of hydroxylammonium salts and hydroxylamine)
IT 12036-10-1, Ruthenium dioxide
(anode in **electrolytic** cell for electrosynthesis of hydroxylammonium salts and hydroxylamine)
IT 12597-68-1, Stainless steel, uses
(**cathode** in **electrolytic** cell for electrosynthesis of hydroxylammonium salts and hydroxylamine)
IT 7782-42-5, Graphite, uses
(**cathode** in **electrolytic** cell for electrosynthesis of hydroxylammonium salts and hydroxylamine)
IT 107-13-1, Acrylonitrile, properties
(conversion to adiponitrile in **electrolytic** cell using mediator and catalytic film)
IT 111-69-3, Adiponitrile

(formation from acrylonitrile in **electrolytic** cell using mediator and catalytic film)

IT 66-71-7, 1,10-Phenanthroline 92-82-0, Phenazine 92-85-3, Thianthrene 95-55-6, o-Aminophenol 100-21-0, Terephthalic acid, uses 100-22-1, N,N,N',N'-Tetramethyl-p-phenylenediamine 101-80-4, 4,4'-Oxydianiline 102-54-5, Ferrocene 103-84-4, Acetanilide 106-50-3, 1,4-Phenylenediamine, uses 108-45-2, 1,3-Phenylenediamine, uses 122-80-5, 4'-Aminoacetanilide 123-30-8, p-Aminophenol 123-31-9, Hydroquinone, uses 479-27-6, 1,8-Diaminonaphthalene 591-27-5 623-27-8, 1,4-Benzenedicarboxaldehyde **853-35-0D**, Anthraquinone-1,5-disulfonic acid disodium salt, sodium salt **853-68-9**, Anthraquinone-2,6-disulfonic acid disodium salt 1009-61-6, 1,4-Diacetylbenzene 1159-53-1 1518-16-7, Tetracyanoquinodimethane 1910-42-5, Methylviologen dichloride 1998-66-9 20103-09-7, 2,5-Dichloro-1,4-phenylenediamine 25620-59-1, Aminoanthraquinone 31366-25-3, Tetrathiafulvalene 40451-21-6, Aminothiophenol 111548-68-6D, Anthracenesulfonic acid, amino-9,10-dihydro-9,10-dioxo, sodium salt
(formation of catalytic film for electrosynthesis of hydroxylammonium salts and hydroxylamine)

IT 7440-44-0, Glassy carbon, uses
(glassy; **cathode** in **electrolytic** cell for electrosynthesis of hydroxylammonium salts and hydroxylamine)

IT 99039-30-2, Nafion 423
(use in **electrolytic** cell for electrosynthesis of hydroxylammonium salts and hydroxylamine)

L40 ANSWER 10 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

1998:382026 Document No. 129:114713 Electrochemical reduction of 2-ethyl-9,10-anthraquinone on reticulated vitreous carbon and mediated formation of hydrogen peroxide. Huissoud, A.; Tissot, P. (Departement de Chimie Minerale, Analytique et Appliquee, Universite de Geneve, Geneva, CH-1211, Switz.). Journal of Applied Electrochemistry, 28(6), 653-657 (English) **1998**. CODEN: JAELBJ. ISSN: 0021-891X. Publisher: Chapman & Hall.

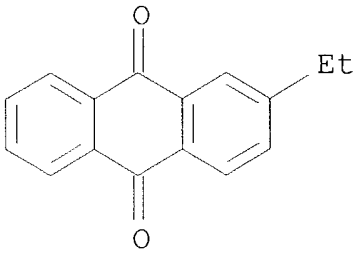
AB Hydrogen peroxide formation by the intermediate electroredn. of 2-ethylanthraquinone (EAQ) was examd. The medium used for this preparative electrolysis was dimethoxyethane (DME) with tetraethylammonium tetrafluoroborate (TEATFB) salt as supporting **electrolyte** in the presence of a small percentage of water. In this process EAQ is reduced on a reticulated vitreous carbon (RVC) **cathode** in the presence of oxygen. In this medium, the presence of EAQ enhances the hydrogen peroxide formation when compared to the direct redn. of oxygen in the same medium. The influence of EAQ on the oxygen redn. also was examd. by cyclic voltammetry on a vitreous carbon **cathode**.

IT **84-51-5**, 2-Ethyl-9,10-anthraquinone

(electrochem. redn. of ethylanthraquinone on reticulated vitreous carbon and mediated formation of hydrogen peroxide)

RN 84-51-5 HCAPLUS

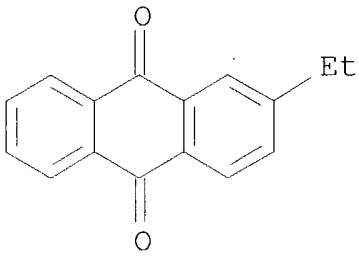
CN 9,10-Anthracenedione, 2-ethyl- (9CI) (CA INDEX NAME)



IT **111870-38-3**, 2-Ethyl-9,10-anthraquinone radical ion(1-)
(electrochem. reductive formation and electrochem. redn. with hydrolysis in oxygen redn. with HO21- formation)

RN 111870-38-3 HCAPLUS

CN 9,10-Anthracenedione, 2-ethyl-, radical ion(1-) (9CI) (CA INDEX NAME)



CC **72-2** (Electrochemistry)
Section cross-reference(s): 22, 67

IT **Electrolytic cells**
(membrane; for **electrochem.** redn. of ethylanthraquinone on reticulated vitreous carbon and mediated formation of hydrogen peroxide)

IT **84-51-5**, 2-Ethyl-9,10-anthraquinone
(electrochem. redn. of ethylanthraquinone on reticulated vitreous carbon and mediated formation of hydrogen peroxide)

IT **111870-38-3**, 2-Ethyl-9,10-anthraquinone radical ion(1-)
(electrochem. reductive formation and electrochem. redn. with hydrolysis in oxygen redn. with HO21- formation)

IT 66796-30-3, Nafion 117
(membrane in **cell** for **electrochem.** redn. of

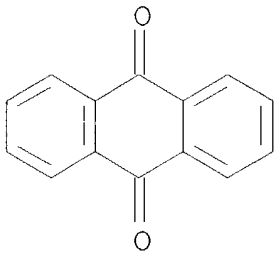
ethylanthraquinone on reticulated vitreous carbon and mediated formation of hydrogen peroxide)

L40 ANSWER 11 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1998:357620 Document No. 129:43275 **Secondary** sealed anthraquinone **battery** with alkaline electrolyte. Beck, Fritz; Chromik, Ralph; Krohn, Holger; Suden, Gerd Tom; Wermeckes, Bernd (Beck, Fritz, Germany). Ger. Offen. DE 19648892 A1 **19980528**, 18 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1996-19648892 19961126.

AB The **battery** anode of anthraquinone or an anthraquinone deriv. contains 20-50 and preferably 25-35 wt.% soot with a sp. surface area 30-1500 m2/g. The **battery cathode** is Ni oxide, MnO2/BiOx, or Ag(OH)2/AgO/Ag2O3, and the aq. electrolyte comprises 20-50 or preferably 30-45 wt.% KOH or NaOH.

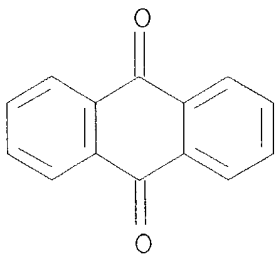
IT **84-65-1**, Anthraquinone
(anodes in **secondary battery** with alk. electrolyte)

RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



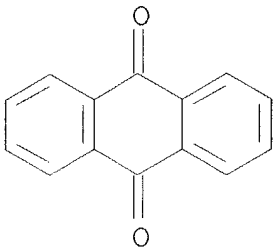
IT **84-65-1D**, Anthraquinone, derivs.
(anodes in **secondary battery** with alk. electrolyte)

RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



IC ICM H01M004-24
ICS H01M004-32; H01M004-34
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** alk electrolyte anthraquinone deriv anode
IT **Secondary batteries**
(anthraquinone with aq. alk. electrolyte)
IT **84-65-1**, Anthraquinone
(anodes in **secondary battery** with alk. electrolyte)
IT **84-65-1D**, Anthraquinone, derivs.
(anodes in **secondary battery** with alk. electrolyte)
IT 1313-99-1, Nickel oxide, uses
(**cathodes** in **secondary** anthraquinone **battery** with alk. electrolyte)

L40 ANSWER 12 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1997:221653 Document No. 126:283989 Indirect electrooxidation with phase transfer catalysis for preparing anthraquinone: development of an **electrochemical cell** with a graphite rotating electrode. Ferreira, Aurelio Buarque Baird; dos Santos Aragao, Helio; Ferreira, Vitor Francisco (Dep. Quimica, Univ. Federal Rural Rio de Janeiro, Itaguai, Brazil). Quimica Nova, 19(4), 429-432 (Portuguese) **1996**. CODEN: QUNODK. ISSN: 0100-4042. Publisher: Sociedade Brasileira de Quimica.
AB A high-yield process for electrooxidn. of anthracene to anthraquinone using low-cost graphite electrodes and tetrabutylammonium dichromate ((Bu4N)2Cr2O7) as the phase transfer catalyst was developed. The electrooxidn. was performed in a new **electrolytic** cell equipped with a rotating solid cylindrical graphite **cathode** working inside the anode which is also a cylindrical body of graphite contg. several holes.
IT **84-65-1P**, Anthraquinone
(indirect electrooxidn. with phase transfer catalysis for prepg. anthraquinone from anthracene in an **electrochem. cell** with a graphite rotating electrode)
RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



CC **72-2** (Electrochemistry)
Section cross-reference(s): 67

IT Oxidation catalysts
(electrochem.; tetrabutylammonium dichromate phase transfer catalyst for indirect electrooxidn. of anthracene for prepg. anthraquinone in an **electrochem. cell** with a graphite rotating electrode)

IT **Electrolytic** cells
(indirect electrooxidn. of anthracene with phase transfer catalysis for prepg. anthraquinone in an **electrochem. cell** with a graphite rotating electrode)

IT Phase transfer catalysts
(indirect electrooxidn. with phase transfer catalyst of tetrabutylammonium dichromate for prepg. anthraquinone from anthracene in an **electrochem. cell** with a graphite rotating electrode)

IT Oxidation, electrochemical
(indirect electrooxidn.of anthracene for prepg. anthraquinone in an **electrochem. cell** with a graphite rotating electrode)

IT 7782-42-5, Graphite, uses
(electrodes; indirect electrooxidn. with phase transfer catalysis for prepg. anthraquinone from anthracene in an **electrochem. cell** with a graphite rotating electrode)

IT 120-12-7, Anthracene, reactions
(indirect electrooxidn. with phase transfer catalysis for prepg. anthraquinone from anthracene in an **electrochem. cell** with a graphite rotating electrode)

IT **84-65-1P**, Anthraquinone
(indirect electrooxidn. with phase transfer catalysis for prepg. anthraquinone from anthracene in an **electrochem. cell** with a graphite rotating electrode)

IT 56660-19-6, Bis(tetrabutylammonium) dichromate
(phase transfer catalyst; indirect electrooxidn. with phase transfer catalysis for prepg. anthraquinone from anthracene in an **electrochem. cell** with a graphite rotating

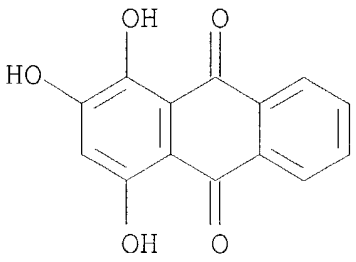
electrode)

L40 ANSWER 13 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1996:599232 Document No. 125:226582 Solid-state **battery** containing proton-donating aromatic compound and efficiently operating at room temperature.. Fleischer, Niles A. (E.C.R. - Electro-Chemical Research Ltd., Israel). U.S. US 5512391 A **19960430**, 8 pp., Cont.-in-part of U.S. 5,382,481. (English). CODEN: USXXAM. APPLICATION: US 1994-208326 19940502. PRIORITY: US 1993-128497 19930907.

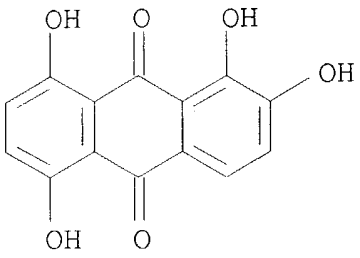
AB The **battery** includes a solid-state protonic conductor **electrolyte**, an anode active material based on an arom. org. compd. capable of producing protons and electrons in an anodic reaction during **battery** discharge, and a solid **cathode** capable of reacting with protons. Anode and **cathode** active materials can be chosen so that the **battery** has the feature that the electrochem. reactions at the anode and **cathode** are at least partly reversible. The **battery** is suitable for electronic consumer products, biomedical applications, elec. vehicle applications, and the like. The **battery** can be fabricated in any desired shape without any special prodn. precautions.

IT **81-54-9**, Purpurin **81-61-8**, 1,2,5,8-Tetrahydroxyanthraquinone **117-12-4**, Anthrarufin
(anode for solid-state **battery** efficiently operating at room temp.)

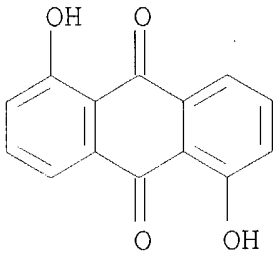
RN 81-54-9 HCAPLUS
CN 9,10-Anthracenedione, 1,2,4-trihydroxy- (9CI) (CA INDEX NAME)



RN 81-61-8 HCAPLUS
CN 9,10-Anthracenedione, 1,2,5,8-tetrahydroxy- (9CI) (CA INDEX NAME)



RN 117-12-4 HCAPLUS
CN 9,10-Anthracenedione, 1,5-dihydroxy- (9CI) (CA INDEX NAME)



IC ICM H01M010-40
NCL 429213000
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 7
ST solid state **battery** room temp; proton donating arom compd **battery** anode
IT Naphthols
Ubiquinones
(anode for solid-state **battery** efficiently operating at room temp.)
IT Anodes
(**battery**, proton-donating arom. compd. solid-state)
IT 51-61-6, Dopamine, uses 61-73-4, Methylene blue **81-54-9**, Purpurin **81-61-8**, 1,2,5,8-Tetrahydroxyanthraquinone 87-66-1, Pyrogallol 103-90-2, Acetaminophen 108-73-6, Phloroglucinol **117-12-4**, Anthrarufin 123-31-9, Hydroquinone, uses 517-82-8, Echinochrome 529-86-2, Anthranol 552-21-6 9000-94-6, Antithrombin 10005-77-3, Purprogenin 27175-63-9, Hydroxybenzyl alcohol 41903-50-8, Hydroxyacetophenone 126045-04-3, Tetrahydroxybenzophenone
(anode for solid-state **battery** efficiently operating at room temp.)

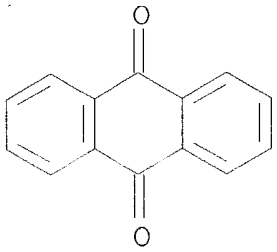
IT 11104-88-4, Molybdophosphoric acid 12067-99-1, Tungstophosphoric acid
(anode for solid-state **battery** efficiently operating at room temp. contg.)

L40 ANSWER 14 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1996:333405 Document No. 125:37943 Optimization of cyclic behavior of the metal-free GIC/H2F2/AQ rechargeable **battery**. Krohn, H.; Ther, E.; Tormin, U.; Wermeckes, B.; Beck, F. (Universitaet Duisburg, Fachgebiet Elektrochemie, Duisburg, D-47057, Germany). NATO ASI Series, Series 3: High Technology, 6(New Promising Electrochemical Systems for Rechargeable Batteries), 433-450 (English) **1996**. CODEN: NAHTF4. Publisher: Kluwer.

AB Natural graphite (Cx) and (substituted) anthraquinones (R-AQ) are used as pos. and neg. active materials in a metal-free **secondary battery**. During charging, the graphite is oxidized to a graphite intercalation compd. (GIC), while the anthraquinone is reduced to the anthrahydroquinone (AQH2). Thus, the overall reaction for the reversible charge/discharge reaction with hydrofluoric acid as electrolyte is given by 2 [Cx] + R-AQ + 6 H2F2 = 2 [Cx+HF2-2H2F2] + R-AQH2. The electrolytes were mainly H2F2 or H2SO4 in the present paper. The concn. of the acid is a crit. parameter. The anthrahydroquinone is not stable at lower pH values. An irreversible disproportionation of AQH2 yielding AQ and anthrone (AN) is obsd. The rate of this side reaction increases with the acidity. Some derivs. of AQ and buffered electrolytes were investigated in addn. On cycling current efficiency α was nearly 100% after some formation. Active mass utilization μ decreased, however, rapidly in the initial stage. Thereafter, a quasi steady state was attained, which is 20% for AQ after 60 cycles, but 50% for 1-Cl-AQ. Theor. energy d. for 50% HF is about 60 Wh/kg, which is well above the value for the other acids.

IT **84-65-1**, 9,10-Anthracenedione
(anode; optimization of cyclic behavior of the metal-free graphite intercalation compd./hydrogen fluoride/ anthraquinone rechargeable **battery**)

RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): **72**
ST **battery secondary** metal free; graphite **cathode** anthraquinone anode **battery** rechargeable
IT **Batteries, secondary**
Battery electrolytes
(optimization of cyclic behavior of the metal-free graphite intercalation compd./hydrogen fluoride/ anthraquinone rechargeable **battery**)
IT **84-65-1**, 9,10-Anthracenedione
(anode; optimization of cyclic behavior of the metal-free graphite intercalation compd./hydrogen fluoride/ anthraquinone rechargeable **battery**)
IT 7782-42-5, Graphite, uses
(**cathode**; optimization of cyclic behavior of the metal-free graphite intercalation compd./hydrogen fluoride/ anthraquinone rechargeable **battery**)
IT 7601-90-3, Perchloric acid, uses 7664-39-3, Hydrogen fluoride, uses 7664-93-9, Sulfuric acid, uses 16872-11-0, Tetrafluoroboric acid
(electrolyte; optimization of cyclic behavior of the metal-free graphite intercalation compd./hydrogen fluoride/ anthraquinone rechargeable **battery**)
IT 4981-66-2, 9,10-Anthracenediol
(optimization of cyclic behavior of the metal-free graphite intercalation compd./hydrogen fluoride/ anthraquinone rechargeable **battery**)

L40 ANSWER 15 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1995:594341 Document No. 122:318694 Solid-state **battery** containing proton-donating aromatic compound. Fleischer, Niles A. (E.C.R - Electro-Chemical Research Ltd., Israel). PCT Int. Appl. WO 9507555 A1 **19950316**, 25 pp. DESIGNATED STATES: W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, UZ, VN; RW: AT, BE, BF,

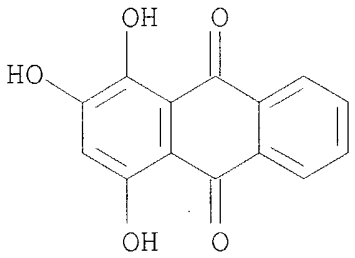
BJ, CF, CG, CH, CI, CM, DE, DK, ES, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1994-US9692 19940823. PRIORITY: US 1993-128497 19930907; US 1994-208326 19940502.

AB The **battery** which operates efficiently at .apprx.20° includes a solid-state proton conductor **electrolyte**, an anode active material based on an arom. org. compd. capable of producing protons and electrons in an anodic reaction during **battery** discharge, and a solid **cathode** capable of reacting with protons. The active materials can be chosen so that the **battery** has the feature that the electrochem. reactions are at least partly reversible. The **battery** is suitable for electronic consumer products, biomedical applications, elec. vehicle applications, etc. The **battery** can be fabricated in any desired shape without any special prodn. precautions.

IT **81-54-9**, Purpurin **81-61-8**, 1,2,5,8-Tetrahydroxyanthraquinone **117-12-4**, Anthrarufin
(solid-state **battery** with proton-donating arom. compd. anode)

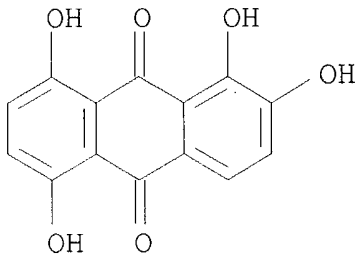
RN 81-54-9 HCAPLUS

CN 9,10-Anthracenedione, 1,2,4-trihydroxy- (9CI) (CA INDEX NAME)

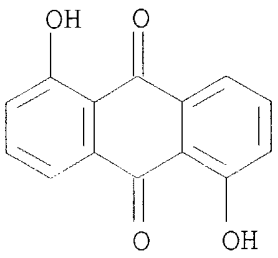


RN 81-61-8 HCAPLUS

CN 9,10-Anthracenedione, 1,2,5,8-tetrahydroxy- (9CI) (CA INDEX NAME)



RN 117-12-4 HCAPLUS
CN 9,10-Anthracenedione, 1,5-dihydroxy- (9CI) (CA INDEX NAME)



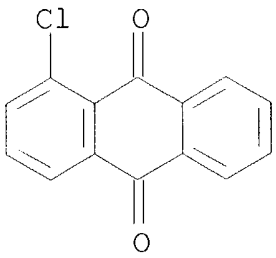
IC ICM H01M010-40
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** anode proton donating arom compd
IT Anodes
(**battery**, proton-donating arom. compd.-contg.)
IT 51-61-6, Dopamine, uses 61-73-4, Methylene blue 80-72-8, Reductic acid **81-54-9**, Purpurin **81-61-8**, 1,2,5,8-Tetrahydroxyanthraquinone 87-66-1, Pyrogallol 99-11-6, Citrazinic acid 103-16-2, Hydroquinone monobenzyl ether 103-90-2, Acetaminophen 108-73-6, Phloroglucinol **117-12-4**, Anthrarufin 118-76-3, Rhodizonic acid 123-31-9, Hydroquinone, uses 150-76-5, Hydroquinone monomethyl ether 319-89-1, Tetrahydroxyquinone 488-86-8, Croconic acid 517-82-8, Echinochrome 529-86-2, Anthranol 552-21-6 569-77-7, Purpurogallin 608-80-0, Hexahydroxybenzene 1321-67-1, Naphthol 1322-20-9, Hydroxy biphenyl 2892-51-5, Squaric acid 4747-99-3, Tetrahydropapaveroline 20725-03-5, Fustin 27175-63-9, Hydroxybenzyl alcohol 33434-94-5, Pyridinemethanol 35344-07-1, Hydroxybenzophenone 41903-50-8, Hydroxy acetophenone 63635-39-2 126045-04-3, Tetrahydroxybenzophenone 133176-62-2
(solid-state **battery** with proton-donating arom. compd. anode)

L40 ANSWER 16 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1994:413972 Document No. 121:13972 **Secondary** metal-free **battery** with protic electrolyte. Barsukov, Igor; Barsukov, Vyacheslav Z.; Beck, Fritz; Boinowitz, Tammo; Korneev, Nikolai V.; Krohn, Holger; Matveev, Vadim; Motronyuk, Tatyana I.; Ther. Eduard; et al. (Germany). Ger. Offen. DE 4333040 A1 **19940407**, 14 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1993-4333040 19930930.
AB The **battery** comprises a **cathode** of porous cryst. graphite; an anode of anthraquinone, 2-ethylanthraquinone,

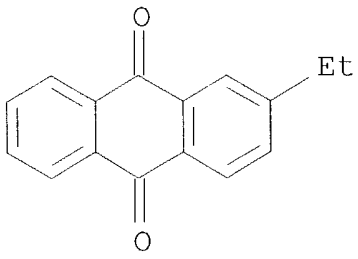
2-cyclohexylanthraquinone, 1-chloroanthraquinone, or 1-cyanoanthraquinone and 15-35 wt.% SiO2, Al2O3, or SiC; and an electrolyte of H2SO4, HClO4, HF, or HBF4 in H2O or a protic solvent. The anode also can contain SiO2, Al2O3, or SiC. The electrode grids are made of polyolefins and esp. polypropylene and 2-25 wt.% SiO2, Al2O3, or SiC.

IT **82-44-0**, 1-Chloroanthraquinone **84-51-5**, 2-Ethylanthraquinone **84-65-1**, Anthraquinone **27485-16-1**
(anodes, for metal-free **batteries** with protic electrolytes)

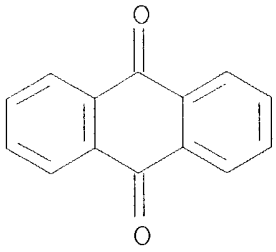
RN 82-44-0 HCAPLUS
CN 9,10-Anthracenedione, 1-chloro- (9CI) (CA INDEX NAME)



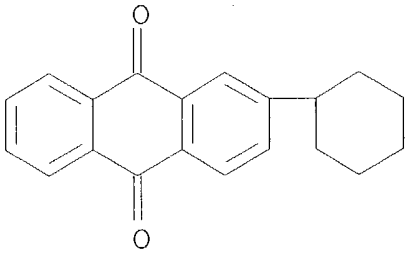
RN 84-51-5 HCAPLUS
CN 9,10-Anthracenedione, 2-ethyl- (9CI) (CA INDEX NAME)



RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



RN 27485-16-1 HCAPLUS
CN 9,10-Anthracenedione, 2-cyclohexyl- (9CI) (CA INDEX NAME)



IC ICM H01M010-36
ICS H01M004-36; H01M004-58
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** metal free anthraquinone; electrolyte protic metal free **battery**
IT **Batteries, secondary**
(metal-free)
IT **Battery** electrolytes
(protic, metal-free)
IT **82-44-0**, 1-Chloroanthraquinone **84-51-5**, 2-Ethylanthraquinone **84-65-1**, Anthraquinone **27485-16-1** 38366-32-4, 1-Cyanoanthraquinone
(anodes, for metal-free **batteries** with protic electrolytes)
IT 7782-42-5, Graphite, uses
(**cathodes**, cryst. porous, for metal-free **batteries** with protic electrolytes)
IT 7601-90-3, Perchloric acid, uses 7664-39-3, Hydrofluoric acid, uses 7664-93-9, Sulfuric acid, uses 16872-11-0, Fluoroboric acid
(electrolyte, for metal-free **batteries**)

L40 ANSWER 17 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

1992:259053 Document No. 116:259053 **Secondary batteries** with coated anodes. Nakane, Ikuro; Fujita, Yasuhiro; Furukawa, Sanehiro (Sanyo Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 04028172 A2 **19920130** Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1990-131673 19900522.

AB The **batteries** use MnO2, MoO3, V2O5, or TiS2 **cathodes** and alkali metal (e.g., Li), alk. earth metal, or Al anodes, which are coated with a 1st protective layer and an elastomer-, conducting polymer-, or ion-conductive polymer-based layer. The 1st layer may be salts, oxides, or hydroxides of alkali or alk. earth metals or compds. of P, As, Sb, and/or Bi, the elastomer may be ethylene-propylene or ethylene-propylene-nonconjugated diene copolymers, the conducting polymer may be poly(p-phenylene), polyacetylene, polyaniline, polypyrrole, etc., and the ion-conductive polymer may be PEO or other polymers contg. dispersed Li salts. These **batteries** have long cycle life.

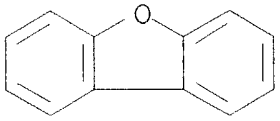
IT **102250-99-7**
(anodes with coatings contg., lithium, for **secondary batteries**)

RN 102250-99-7 HCAPLUS

CN Dibenzofuran, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 132-64-9
CMF C12 H8 O



IC ICM H01M010-40
ICS H01M004-02

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST polymer coating lithium **battery** anode; phosphorus pentachloride coating lithium anode; magnesia coating lithium anode

IT Rubber, synthetic
(EPDM, anodes with coatings contg., lithium, for **secondary batteries**)

IT Anodes
(**battery**, lithium, coated, for long cycle life)

IT 7791-03-9, Lithium perchlorate
(PEO contg. dispersed, anodes with coatings contg., lithium, for

secondary batteries)

IT 513-77-9, Barium carbonate 1309-48-4, Magnesia, uses 1310-65-2, Lithium hydroxide 9003-39-8, Polyvinylpyrrolidone 9010-79-1, Ethylene-propylene copolymer 10026-13-8, Phosphorus pentachloride 14283-07-9, Lithium fluoroborate 24937-79-9, Poly(vinylidene fluoride) 25014-41-9, Polyacrylonitrile 25067-54-3, Polyfuran 25067-58-7, Polyacetylene 25190-62-9, Poly(p-phenylene) 25212-74-2, Poly(p-phenylenesulfide) 25233-30-1, Polyaniline 25233-34-5, Polythiophene 25322-69-4, Poly(propylene oxide) 26009-24-5, Poly(p-phenylenevinylene) 26499-97-8, Poly(1,3-phenylene) 26915-72-0 29935-35-1, Lithium hexafluoroarsenate 30604-81-0, Polypyrrole 31691-80-2, Poly(thio[1,1'-biphenyl]-4,4'-diyl) 32027-35-3, Poly(m-phenylenesulfide) 33454-82-9, Lithium trifluoromethanesulfonate 51555-21-6, Polycarbazole 75788-67-9, Polyphenothiazine **102250-99-7** 114503-66-1
(anodes with coatings contg., lithium, for **secondary batteries**)

IT 7439-93-2, Lithium, uses
(anodes, coated, for **secondary batteries**, for long cycle life)

IT 25322-68-3, PEO
(lithium perchlorate-dispersed, anodes with coatings contg., lithium, for **secondary batteries**)

IT 74-85-1
(rubber, EPDM, anodes with coatings contg., lithium, for **secondary batteries**)

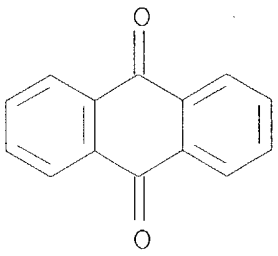
L40 ANSWER 18 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

1991:659839 Document No. 115:259839 **Batteries** of chloranil-dihydroanthraquinone system. 1. Optimization of technology of electrode preparation and selection of the electrolyte. Ksenyheik, O. S.; Gurskii, V. M.; Petrova, S. A. (USSR). Voprosy Khimii i Khimicheskoi Tekhnologii, 92, 3-8 (Russian) **1990**. CODEN: VKKCAJ. ISSN: 0321-4095.

AB The exptl. planning method was used for optimizing the electrode compn. and pressure used in the electrode prepn. The optimal anthraquinone:acetylene black wt. ratio is 1.3-1.5, and the optimal prepn. pressure is 280-300 kg/cm2. The obtained anodes have sp. capacity 123-127 A-h/kg and anthraquinone utilization coeff. 82%. The resp. values for the chloranil-acetylene black **cathodes** are 1.5, 250 kg/cm2, 78-80 and 85-90 A-h/kg, and 60%. The resp. optimal thicknesses of both electrodes at 5-10 and 20-50 mA/cm2 are 2-7 and 1-1.5 mm. The electrochem. characteristics of the electrodes decrease with decreasing dissocn. const. of the acid electrolyte. The cycle life of the title **batteries** is >300 cycles at 10 mA/cm2.

IT **84-65-1**, 9,10-Anthracenedione

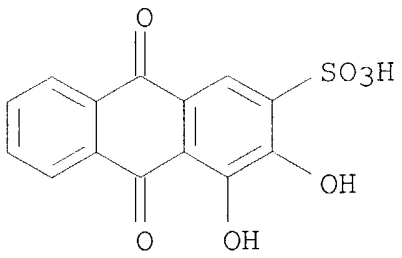
(anodes, optimization of, for **batteries**)
RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** chloranil dihydroanthraquinone performance; chloranil **cathode battery** optimization; dihydroanthraquinone anode **battery** optimization
IT **Batteries, secondary**
(chloranil-dihydroanthraquinone, performance of, effect of acid electrolyte on)
IT **Cathodes**
(**battery**, chloranil, optimization of)
IT Anodes
(**battery**, dihydroanthraquinone, optimization of)
IT **84-65-1**, 9,10-Anthracenedione
(anodes, optimization of, for **batteries**)
IT 118-75-2, Chloranil, uses and miscellaneous
(**cathodes**, optimization of, for **batteries**)

L40 ANSWER 19 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1990:162251 Document No. 112:162251 Lead-acid starter **batteries**. Winsel, August (VARTA Batterie A.-G., Germany). Ger. Offen. DE 3828374 A1 **19900222**, 4 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1988-3828374 19880820.
AB The **batteries** of high charging capacity at low temps. include **cathodes** contg. expanders at varying concns. and/or of different types, i.e., strong expanders such as hydroxylignin, weak expanders such as Alizarin red S, or mixts. of an expander with different amts. of carbon black or active C. The invention **batteries** showed good starting capability and high charging capacity at low temps.
IT **130-22-3**, Alizarin red S
(expander, **cathodes** contg., in lead-acid **batteries** for low-temp. performance)
RN 130-22-3 HCAPLUS

CN 2-Anthracenesulfonic acid, 9,10-dihydro-3,4-dihydroxy-9,10-dioxo-, monosodium salt (8CI, 9CI) (CA INDEX NAME)



● Na

IC ICM H01M010-06
ICS H01M002-14
ICI C08L097-00, C08K003-08, C08K003-22, C08K003-30
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST lead starter **battery cathode** expander; hydroxylignin expander lead **battery cathode**; Alizarin red expander **battery cathode**; carbon hydroxylignin expander **battery cathode**
IT Carbon black, uses and miscellaneous
(expander, **cathodes** contg., in lead-acid **batteries** for low-temp. performance)
IT **Batteries, secondary**
(lead-acid, starter, for low-temp. performance)
IT **Cathodes**
(**battery**, lead, expanders in, for low-temp. performance)
IT 7439-92-1, Lead, uses and miscellaneous
(**cathodes**, expanders in, for low-temp. preformance of lead-acid **batteries**)
IT **130-22-3**, Alizarin red S 7440-44-0, Carbon, uses and miscellaneous 8061-51-6, Vanisperse A 119791-89-8
(expander, **cathodes** contg., in lead-acid **batteries** for low-temp. performance)

L40 ANSWER 20 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1988:513399 Document No. 109:113399 A photoassisted rechargeable cell with a polymer modified p-indium phosphide (InP) semiconductor anode and a polypyrrole **cathode**. Holdcroft, Steven; Funt, B. Lionel (Dep. Chem., Simon Fraser Univ., Burnaby, BC, V5A 1S6, Can.).

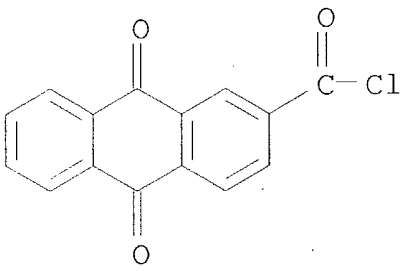
Journal of Applied Electrochemistry, 18(4), 619-24 (English) **1988**. CODEN: JAELBJ. ISSN: 0021-891X.

AB A photoassisted rechargeable cell with a p-InP anode coated with a polyanthraquinone redox polymer film and a polypyrrole-coated Pt **cathode** immersed in 0.1M Et4NCl4-MeCN was photoelectrochem. charged and then discharged in the dark. The system showed no degrdn. on electroactivity after 25 cycles. The charge storage capacity and the effectiveness of the photoassistance is limited by incomplete electroactivity of the redox polymer film and the small photovoltages generated by the p-InP/polyanthraquinone electrode. The role of Fermi level pinning in limiting the performance is assessed.

IT **6470-87-7D**, 2-Anthraquinonecarbonyl chloride, reaction product with polystyrene
(indium phosphide anode modified by, photoassisted rechargeable cell with polypyrrole **cathode** and, properties of)

RN 6470-87-7 HCAPLUS

CN 2-Anthracenecarbonyl chloride, 9,10-dihydro-9,10-dioxo- (9CI) (CA INDEX NAME)



CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, **72**, 76

ST photoelectrochem cell polymer indium phosphide; **battery** photoassisted rechargeable indium phosphide; anode photoelectrochem polymer indium phosphide; polyanthraquinone indium phosphide photoelectrochem anode; polypyrrole **cathode** photoelectrochem cell; conductive polymer polypyrrole photoassisted **battery**

IT Electric conductors
(polymeric, polyanthraquinone and polypyrrole, in photoassisted rechargeable **batteries**)

IT **Batteries, secondary**
(photogalvanic, polyanthraquinone-modified indium phosphide/polypyrrole, properties of)

IT 22398-80-7, Indium phosphide, uses and miscellaneous
(anodes, polyanthraquinone-coated, photoassisted rechargeable

cell with polypyrrole **cathode** and, properties of)

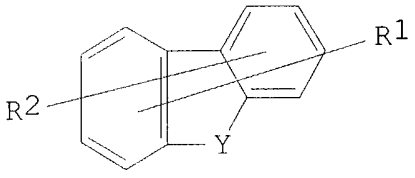
IT 7440-06-4, Platinum, uses and miscellaneous
(**cathodes** from polypyrrole-coated, photoassisted rechargeable cell with polymer-modified indium phosphide anode and, properties of)

IT 30604-81-0, Polypyrrole
(**cathodes**, photoassisted rechargeable cell with polymer-modified indium phosphide anode and, properties of)

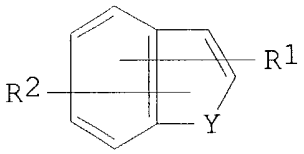
IT **6470-87-7D**, 2-Anthraquinonecarbonyl chloride, reaction product with polystyrene 9003-53-6D, Polystyrene, reaction product with 2-anthraquinonecarbonyl chloride
(indium phosphide anode modified by, photoassisted rechargeable cell with polypyrrole **cathode** and, properties of)

L40 ANSWER 21 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1987:518317 Document No. 107:118317 **Secondary batteries.** Suzuki, Tetsuyoshi; Hasegawa, Kazumi; Fujimoto, Masahisa; Nishio, Koji; Furukawa, Sanehiro (Sanyo Electric Co., Ltd., Japan; Mitsubishi Chemical Industries Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 62110257 A2 **19870521** Showa, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-250388 19851108.

GI



I



II

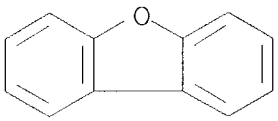
AB Org. semiconductors of reaction products of NOmX (X = halogen-contg. inorg. group, and m = 1 or 2) and I or II (R1, R2 = H, alkyl, alkoxy, aryl, aryloxy, thioether, amino, aldehyde, cyano, nitro group, or halogen; Y = NR3, O, S, or Se; and R3 = H, alkyl, or aryl) are used as **cathodes** and/or anodes for **secondary batteries.** A suspension of 11.68 g NOBF4 in 50 mL mol. sieve-dried MeCN was stirred in N at .apprx.20°, 16.70 g carbazole was added to the suspension, reacted for 2 h, rested overnight at .apprx.20°, mixed with MeOH, filtered, the solid was washed with MeOH, dried at 60° under reduced pressure to obtain a black C12.00H8.94N1.25F1.00 powder having an elec. cond. of 6.0 + 10-5 S/cm. When cycled at 5-h charging at 1 mA and 1-mA discharging to 2.0 V cutoff, a Li **battery** using a **cathode** of this powder and a 1M LiBF4/propylene carbonate electrolyte had a charging-discharging efficiency of 94% at the 80th cycle whereas that of a Li-polyacetylene **battery** dropped

sharply after 50th cycles.

IT **132-64-9D**, reaction product with nitrosyl tetrafluoroborate
(**cathodes**, for org.-electrolyte **batteries**)

RN 132-64-9 HCAPLUS

CN Dibenzofuran (8CI, 9CI) (CA INDEX NAME)



IC ICM H01M004-60

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 27, 76

ST **cathode** nitrosyl tetrafluoroborate carbazole compd; **battery cathode** nitrosyl tetrafluoroborate carbazole

IT **Cathodes**
(**battery**, from reaction products of nitrosyl tetrafluoroborate and condensed-ring heterocyclic compds.)

IT 86-74-8D, Carbazole, reaction product with nitrosyl tetrafluoroborate 95-15-8D, Benzothiophene, reaction product with nitrosyl tetrafluoroborate **132-64-9D**, reaction product with nitrosyl tetrafluoroborate 14635-75-7D, Nitrosyl tetrafluoroborate (NOBF4), reaction products with condensed-ring heterocyclic compds.
(**cathodes**, for org.-electrolyte **batteries**)

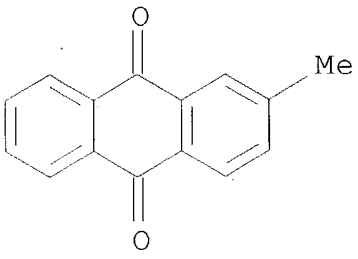
L40 ANSWER 22 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

1981:211592 Document No. 94:211592 Hermetically sealed lead **battery**. Barsukov, V. Z.; Dunovskii, S. A.; Saroyan, L. N.; Trepalin, A. I.; Aguf, I. A.; Smolkova, V. S. (Dnepropetrovsk Chemical-Technological Institute, USSR). Ger. Offen. DE 3006564 **19801204**, 28 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1980-3006564 19800221.

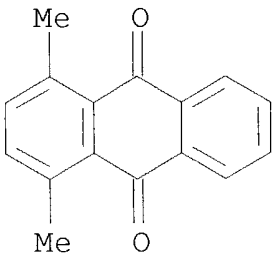
AB The title **battery** comprises a casing, >1 **cathode**, >1 anode, and a getter electrode arranged in the hollow space of the casing or in combination with the anode. The electrode is prepd. from an elec. conducting C-contg. material and a quinone compd. with low redox potential and a low soly. in water. Thus, several Pb-acid **batteries** with graphite getter electrodes contg. 20-80% hydroanthraquinone [4981-66-2] or an anthraquinone deriv. were prepd. Their specific energy was .apprx.20 W-h/kg. The abs. pressure inside the **batteries** on charging was <0.9 atm.

IT **84-54-8 1519-36-4 20153-30-4**
77783-57-4 77783-58-5 77783-59-6
77783-60-9 77783-61-0
(electrodes contg., getter, lead-acid **battery**)

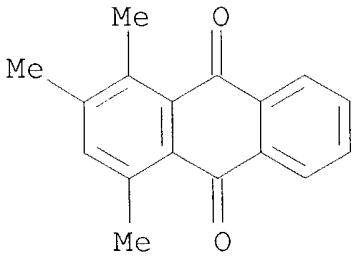
RN 84-54-8 HCAPLUS
CN 9,10-Anthracenedione, 2-methyl- (9CI) (CA INDEX NAME)



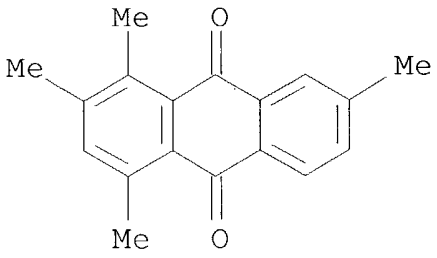
RN 1519-36-4 HCAPLUS
CN 9,10-Anthracenedione, 1,4-dimethyl- (9CI) (CA INDEX NAME)



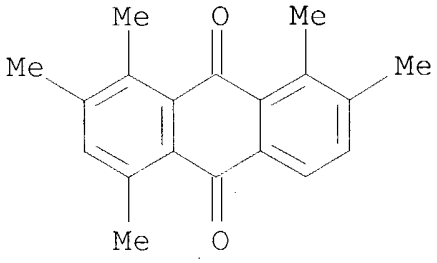
RN 20153-30-4 HCAPLUS
CN 9,10-Anthracenedione, 1,2,4-trimethyl- (9CI) (CA INDEX NAME)



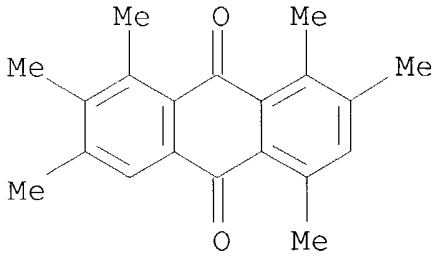
RN 77783-57-4 HCAPLUS
CN 9,10-Anthracenedione, 1,2,4,7-tetramethyl- (9CI) (CA INDEX NAME)



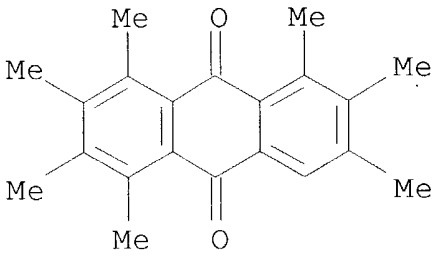
RN 77783-58-5 HCAPLUS
CN 9,10-Anthracenedione, 1,2,4,7,8-pentamethyl- (9CI) (CA INDEX NAME)



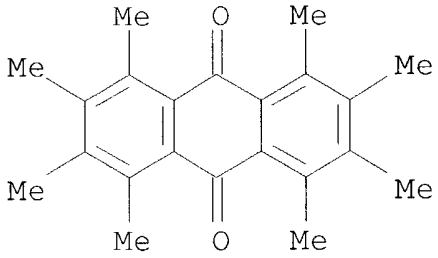
RN 77783-59-6 HCAPLUS
CN 9,10-Anthracenedione, 1,2,3,5,7,8-hexamethyl- (9CI) (CA INDEX NAME)



RN 77783-60-9 HCAPLUS
CN 9,10-Anthracenedione, 1,2,3,4,5,6,7-heptamethyl- (9CI) (CA INDEX NAME)



RN 77783-61-0 HCAPLUS
CN 9,10-Anthracenedione, 1,2,3,4,5,6,7,8-octamethyl- (9CI) (CA INDEX NAME)



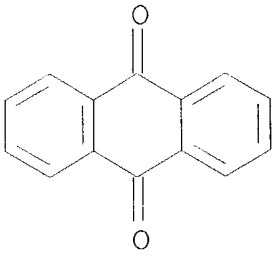
IC H01M010-34; H01M010-52; H01M010-12
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST lead acid sealed **battery**; getter electrode sealed lead **battery**; hydroanthraquinone getter electrode lead **battery**; anthraquinone deriv electrode lead **battery**
IT **Batteries, secondary**
(sealed, lead-acid)
IT **84-54-8 1519-36-4** 4981-66-2 **20153-30-4 77783-57-4 77783-58-5 77783-59-6 77783-60-9 77783-61-0**
(electrodes contg., getter, lead-acid **battery**)

L40 ANSWER 23 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1981:199804 Document No. 94:199804 **Battery** using an organic **cathode** active material. (Nippon Electric Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 55161375 **19801215** Showa, 13 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1979-69732 19790604.
AB A **battery** is obtained by placing an **electrolyte** (solid or liq.) between an alkali metal or alk. earth metal anode active material and **cathode** active material consisting of

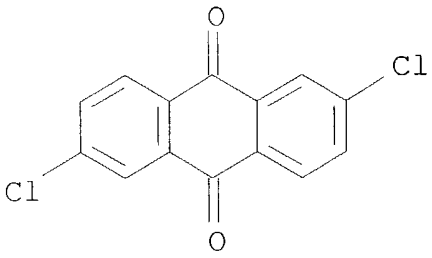
1,4-naphthoquinone, 2,6-naphthoquinone, 1,2-naphthoquinone, 1,6-anthraquinone or their derivs. A high energy d. **battery** is obtained.

IT **84-65-1 605-40-3 3837-38-5 17139-66-1**
(**cathode**, in **batteries** with alkali or alk. earth metal anodes)

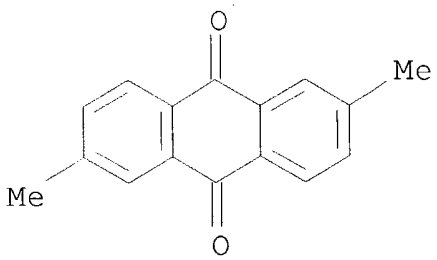
RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



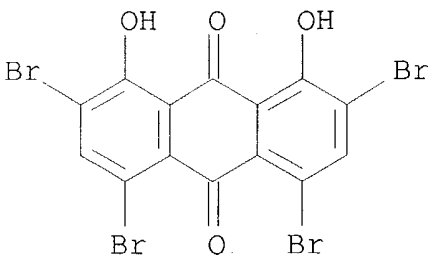
RN 605-40-3 HCAPLUS
CN 9,10-Anthracenedione, 2,6-dichloro- (9CI) (CA INDEX NAME)



RN 3837-38-5 HCAPLUS
CN 9,10-Anthracenedione, 2,6-dimethyl- (9CI) (CA INDEX NAME)



RN 17139-66-1 HCAPLUS
CN 9,10-Anthracenedione, 2,4,5,7-tetrabromo-1,8-dihydroxy- (9CI) (CA INDEX NAME)



IC H01M004-60; H01M004-06; H01M006-06; H01M006-14
CC **72-2** (Electrochemistry)
ST **battery** naphthoquinone **cathode** alkali metal; anthraquinone alk earth metal **battery**; lithium zinc magnesium anode **battery**
IT **Batteries**, primary
(alkali or alk. earth metals with anthraquinone or naphthoquinone derivs.)
IT Alkali metals, uses and miscellaneous
Alkaline earth metals
(anodes, in **batteries** with anthraquinone or naphthoquinone derivs.)
IT **Cathodes**
(**battery**, anthraquinone or naphthoquinone derivs.)
IT 7439-93-2, uses and miscellaneous 7439-95-4, uses and miscellaneous 7440-66-6, uses and miscellaneous
(anode, in **batteries** with anthraquinone or naphthoquinone derivs.)
IT **84-65-1 605-40-3** 607-20-5 **3837-38-5** 7474-84-2 **17139-66-1** 31907-43-4 41280-61-9 61903-52-4 62784-51-4
(**cathode**, in **batteries** with alkali or alk. earth metal anodes)
IT 117-80-6 130-15-4 524-42-5 605-37-8 613-20-7 1018-78-6 2197-57-1 2348-77-8 13243-65-7 18398-36-2 18398-37-3 56961-95-6 77618-47-4 77618-48-5
(**cathodes**, in **batteries** with alkali or alk. earth metal anodes)

L40 ANSWER 24 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1980:522373 Document No. 93:122373 Study of the effect of **electrolyte** composition on the electrochemical behavior of

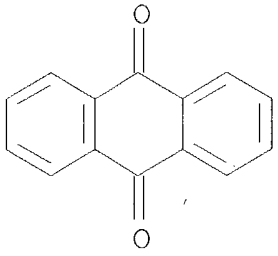
some quinones in acetonitrile. Dinkevich, F. E.; Vovk, A. S.; Ksenzhek, O. S. (USSR). Voprosy Khimii i Khimicheskoi Tekhnologii, 57, 42-6 (Russian) **1979**. CODEN: VKKCAJ. ISSN: 0321-4095.

AB In connection with developing active materials for the **cathodes** of Li **batteries**, the electrochem. behavior (voltammetric) was studied of quinones in MeCN in the presence of different quantities of H2O (0.05-1 m) and supporting **electrolyte** salt. The expts. were conducted with p-benzoquinone, tetrachloro-p-benzoquinone, and anthraquinone dissolved in MeCN. The supporting **electrolyte** was Bu4NI (0.01-1m).

IT **84-65-1**
(voltammetry of, in acetonitrile)

RN 84-65-1 HCAPLUS

CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



CC **72-2** (Electrochemistry)

IT **84-65-1** 106-51-4, reactions 118-75-2, reactions
(voltammetry of, in acetonitrile)

L40 ANSWER 25 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN

1978:81123 Document No. 88:81123 Electrochemical method and apparatus for producing oxygen. Chillier-Duchatel, Nicole; Verger, Bernard (Societe Generale de Constructions Electriques et Mecaniques Alsthom et Cie., Fr.). Fr. Demande FR 2329766 **19770527**, 10 pp. (French). CODEN: FRXXBL. APPLICATION: FR 1975-33082 19751029.

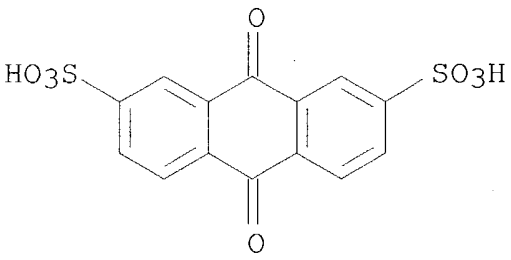
AB Pure O is produced electrochem. by the following successive steps: (1) a buffered medium between pH 7 and 10 is agitated in a reactor with air which reacts on the reduced form of a compd. making it form a peroxide which decomps. spontaneously into H2O and the oxidized form of the compd.; (2) the medium is fed into an **electrochem. cell** divided by a semipermeable membrane into anode and **cathode** compartments where the H2O is decompd. into O at the anode and led off; and (3) the oxidized form of the compd. is reduced in the **cathode** compartment to the reduced form, after which both anode and **cathode** streams are combined and returned to the reactor. Alternatively, a

basic soln. at pH 14 may be used as the medium in the reactor where the reduced form of a compd. reacts to form a peroxide decompg. spontaneously to H2O2 and the oxidized form. In a sep. chamber the H2O2 is catalytically decompd. to H2O and O which is led off. In an **electrochem. cell** the H2O is decompd. to O at the anode and the oxidized form of the compd. is reduced at the **cathode.** The electrochem. oxidn. and redn. is performed at a potential equal to the difference between the oxidn.-redn. potential of the compd. and the oxidn. potential of H2O. The compds. are derivs. of anthraquinone like Na and Li 2,7-anthraquinone disulfonate.

IT **853-67-8 63440-71-1**
(in oxygen electrochem. prodn.)

RN 853-67-8 HCAPLUS

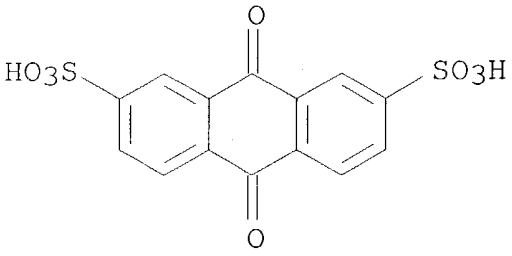
CN 2,7-Anthracenedisulfonic acid, 9,10-dihydro-9,10-dioxo-, disodium salt (7CI, 8CI, 9CI) (CA INDEX NAME)



●2 Na

RN 63440-71-1 HCAPLUS

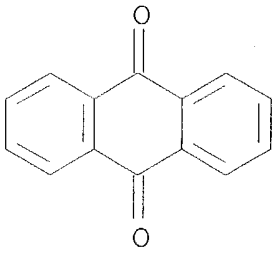
CN 2,7-Anthracenedisulfonic acid, 9,10-dihydro-9,10-dioxo-, dilithium salt (9CI) (CA INDEX NAME)



●2 Li

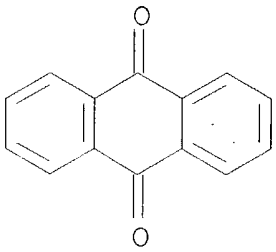
IC C25B001-02
CC **72-10** (Electrochemistry)
ST oxygen prodn **electrolytic** cell; hydrogen peroxide decompn oxygen electroprodn; water decompn oxygen electroprodn
IT **Electrolytic** cells
(for oxygen prodn.)
IT 7722-84-1, reactions 7732-18-5, reactions
(decompn. of, **electrolytic** cell for oxygen prodn. by)
IT **853-67-8 63440-71-1**
(in oxygen electrochem. prodn.)

L40 ANSWER 26 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1977:93047 Document No. 86:93047 Electrochemical study of the 9,10-anthraquinone-anthraquinol couple in the solid state as active electrode material of a secondary generator. Matricali, G.; Dieng, M. M.; Dufeu, J. F.; Guillou, M. (Lab. Thermodyn. Electrochim. Mater., Univ. Paris XII, Creteil, Fr.). Electrochimica Acta, 21(11), 943-52 (French) **1976**. CODEN: ELCAAV. ISSN: 0013-4686.
AB The electrochem. characteristics were detd. of an electrode consisting of the 9,10-anthraquinone [**84-65-1**]-anthraquinol [4981-66-2] couple in the solid state mixed with acetylene black. The equil. potential in 1N H2SO4 is .apprx.-160 mV with respect to the SCE. The capacities were detd. for different operating conditions. An exptl. **battery** with a **cathode** contg. equal proportions of active material and acetylene black gives a voltage of .apprx.0.5 V and has a mass-energy ratio of .apprx.25 Wh/kg of electrode.
IT **84-65-1**
(electrodes, contg. anthraquinol and carbon black, **secondary-battery**)
RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 22
ST anthraquinone anthraquinol couple **cathode; battery cathode** anthraquinone couple; acetylene black anthraquinone **cathode;** equil potential anthraquinone electrode; electrolytic polarization anthraquinone couple
IT **Batteries, secondary**
(anthraquinol-anthraquinone)
IT **84-65-1**
(electrodes, contg. anthraquinol and carbon black, **secondary-battery**)
IT 4981-66-2
(electrodes, contg. anthraquinone and carbon black, **secondary-battery**)

L40 ANSWER 27 OF 27 HCAPLUS COPYRIGHT 2004 ACS on STN
1974:415435 Document No. 81:15435 **Secondary battery** with quinone electrodes. Binder, Horst; Knoedler, Reinhard; Koehling, Alfons; Sandstede, Gerd (Battelle-Institut e.V.). Ger. Offen. DE 2240614 **19740228**, 13 (German). CODEN: GWXXBX. APPLICATION: DE 1972-2240614 19720818.
AB A **battery** contained chloranil as **cathode** and anthraquinone as anode both slurried with carbon and H2SO4 or in solid state. Thus, 4.4 g chloranil for the **cathode** and 3.7 g anthraquinone for the anode were slurried sep. with carbon and H2SO4 and filled in a 2-chamber casing to give a **battery** of capacity 1 A hr andterminal voltage 0.55 V const. for a 20-hr discharge period.
IT **84-65-1**
(anodes, for **secondary battery**)
RN 84-65-1 HCAPLUS
CN 9,10-Anthracenedione (9CI) (CA INDEX NAME)



IC H01M
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST chloranil **cathode battery**; anthraquinone anode **battery**
IT Anodes
(**battery**, anthraquinone)
IT **Cathodes**
(**battery**, chloranil)
IT **84-65-1**
(anodes, for **secondary battery**)
IT 118-75-2, uses and miscellaneous
(**cathode**, for **secondary battery**)

=> d l57 1-12 cbib abs hitstr hitind

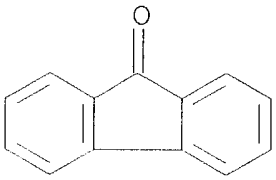
L57 ANSWER 1 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN
2003:656288 Document No. 139:182873 Lithium ion **battery** with improved safety. Chen, Chun-Hua; Hyung, Yoo Eup; Vissers, Donald R.; Amine, Khalil (USA). U.S. Pat. Appl. Publ. US 2003157413 A1 20030821, 14 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-77569 20020215.
AB A lithium **battery** with improved safety is disclosed that utilizes one or more additives in the **battery** electrolyte soln. wherein a lithium salt is dissolved in an org. solvent, which may contain propylene carbonate. For example, a blend of 2 wt% tri-Ph phosphate, 1 wt% di-Ph monobutyl phosphate and 2 wt% vinyl ethylene carbonate additives has been found to significantly enhance the safety and performance of Li-ion **batteries** using a LiPF6 salt in EC/DEC electrolyte solvent. The invention relates to both the use of individual additives and to blends of additives such as that shown in the above example at concns. of 1 to 4-wt% in the lithium **battery** electrolyte. This invention relates to additives that suppress gas evolution in the cell, passivate graphite electrode and protect it from exfoliating in the presence of propylene carbonate solvents in the electrolyte, and retard

flames in the lithium **batteries.**

IT **486-25-9,** 9-Fluorenone
(anode passivation material; lithium ion **battery** with improved safety)

RN 486-25-9 HCAPLUS

CN 9H-Fluoren-9-one (9CI) (CA INDEX NAME)



IC ICM H01M010-40

NCL 429326000; 429329000; 429328000

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST safety improved lithium ion **battery**

IT **Battery** anodes
Fire-resistant materials
Safety
(lithium ion **battery** with improved safety)

IT **Secondary batteries**
(lithium; lithium ion **battery** with improved safety)

IT 89-32-7 108-05-4, Vinyl acetate, uses 302-01-2, Hydrazine, uses **486-25-9,** 9-Fluorenone 614-99-3, Ethyl-2-furoate 931-40-8, 4-Hydroxymethyl-1,3-dioxolan-2-one 1025-15-6 4427-96-7, Vinyl ethylene carbonate 4437-80-3, 4,4-Dimethyl-5-methylene-1,3-dioxolan-2-one 14861-06-4, Crotonic acid, vinyl ester 15896-04-5, 4,5-Diethenyl-1,3-dioxolan-2-one 19693-75-5 27797-53-1, 1,3-Dioxolan-2-one, 4,5-diphenyl 40492-31-7, 4-Methoxymethyl-1,3-dioxolan-2-one 51985-12-7 69124-14-7 95348-48-4 95924-48-4 130221-78-2 135159-09-0 148481-75-8 557084-91-0 579490-82-7, 1,4-Dioxa-2-silacyclopentan-5-one 579490-83-8 579490-84-9 581054-51-5 581054-52-6 581054-53-7
(anode passivation material; lithium ion **battery** with improved safety)

IT 115-86-6, Triphenyl phosphate 463-79-6D, Carbonic acid, cyclic Et ester 2752-95-6, Butyl Diphenyl phosphate 7664-38-2D, Phosphoric acid, alkyl Ph ester
(flame retardant; lithium ion **battery** with improved safety)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethylcarbonate 623-53-0, Ethyl methyl carbonate

1313-99-1, Nickel oxide, uses 1332-37-2, Iron oxide, uses 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 10124-54-6, Manganese phosphate 10377-52-3, Lithium phosphate 10381-36-9, Nickel phosphate 10402-24-1, Iron phosphate 11104-61-3, Cobalt oxide 11129-60-5, Manganese oxide 12057-24-8, Lithium oxide, uses 14283-07-9, Lithium tetrafluoroborate 17409-91-5, Cobalt phosphate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
(lithium ion **battery** with improved safety)

IT 88-12-0, n-Vinyl-2-pyrrolidinone, uses 110-54-3D, Hexane, fluoridated 513-08-6, Tripropyl phosphate 2528-36-1, Dibutyl phenyl phosphate 4427-92-3, Phenyl ethylene carbonate 23466-13-9, Phosphoric acid, dibutyl vinyl ester 27460-01-1, Diphenyl propyl phosphate 29383-23-1, Vinylimidazole 38299-59-1, Phenyl dipropyl phosphate 54952-38-4 105234-62-6 114435-02-8, Fluoroethylene carbonate 171730-81-7 581054-54-8
(lithium ion **battery** with improved safety)

L57 ANSWER 2 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN

2003:241853 Document No. 138:257907 Polymeric sol electrolyte having improved reliability and safety for lithium **battery**. Noh, Hyung-Gon (Samsung SDI Co., Ltd., S. Korea). U.S. Pat. Appl. Publ., US 2003059681 A1 20030327, 13 pp. (English). CODEN: USXXCO. APPLICATION: US 2002-202060 20020725. PRIORITY: KR 2001-49594 20010817.

AB A polymeric sol electrolyte includes a sol-forming polymer and an electrolytic soln. consisting of a lithium salt and an org. solvent. Use of the polymeric sol electrolyte allows problems such as swelling or leakage to be overcome, compared to the case of using a liq.-type electrolytic soln. Also, the polymeric sol electrolyte has better ionic cond. than a polymeric gel electrolyte. In addn., when the lithium **battery** according to the present invention is overcharged at 4.2 V or higher, an electrochem. polymerizable material existing in the polymeric sol electrolyte is subjected to polymn. to prevent heat runaway, which simplifies a sep. protection circuit, leading to a redn. in manufg. cost.

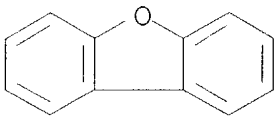
IT **102250-99-7**, Dibenzofuran, homopolymer
(polymeric sol electrolyte having improved reliability and safety for lithium **battery**)

RN 102250-99-7 HCAPLUS

CN Dibenzofuran, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 132-64-9
CMF C12 H8 O



IC ICM H01M010-40
ICS H01M010-04
NCL 429306000; 429314000; 429317000; 029623200; 029623500
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST lithium **battery** polymeric sol electrolyte; safety improved lithium **battery** polymeric sol electrolyte
IT Polymerization
(electrochem.; polymeric sol electrolyte having improved reliability and safety for lithium **battery**)
IT **Secondary batteries**
(lithium; polymeric sol electrolyte having improved reliability and safety for lithium **battery**)
IT Polyolefins
(microporous; polymeric sol electrolyte having improved reliability and safety for lithium **battery**)
IT **Battery** electrolytes
Safety
(polymeric sol electrolyte having improved reliability and safety for lithium **battery**)
IT Acrylic polymers, uses
Carbon fibers, uses
Epoxy resins, uses
Polyoxyalkylenes, uses
Polyurethanes, uses
(polymeric sol electrolyte having improved reliability and safety for lithium **battery**)
IT Fluoropolymers, uses
(polymeric sol electrolyte having improved reliability and safety for lithium **battery**)
IT Sols
(polymeric; polymeric sol electrolyte having improved reliability and safety for lithium **battery**)
IT Glass, uses
Polyesters, uses
(support; polymeric sol electrolyte having improved reliability and safety for lithium **battery**)
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 623-53-0, Ethyl methyl carbonate 7429-90-5, Aluminum, uses 7440-50-8, Copper, uses 9002-88-4, Polyethylene 9003-07-0, Polypropylene 12190-79-3, Cobalt lithium oxide colio2

21324-40-3, Lithium hexafluorophosphate 25322-68-3, Polyethylene glycol 25852-47-5 26008-28-6, Biphenyl homopolymer 26142-30-3 26570-48-9, Polyethylene glycol diacrylate 29062-03-1, o-Terphenyl homopolymer 29062-03-1D, o-Terphenyl homopolymer, hydrogenated **102250-99-7**, Dibenzofuran, homopolymer 502852-63-3 502852-64-4 502852-65-5 502852-66-6
(polymeric sol electrolyte having improved reliability and safety for lithium **battery**)

IT 56-36-0, Tributyltin acetate 124-09-4, 1,6-Hexanediamine, uses 24937-79-9, Pvdf 180049-13-2, Aluminum boride nitride (AlBN)
(polymeric sol electrolyte having improved reliability and safety for lithium **battery**)

IT 25038-59-9, Mylar, uses
(support; polymeric sol electrolyte having improved reliability and safety for lithium **battery**)

L57 ANSWER 3 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN

2003:174311 Document No. 138:207837 Polymer materials for use in an electrode for use in electric energy-generating or -storing devices. Umemoto, Teruo (IM & T Research, Inc., USA). U.S. Pat. Appl. Publ. US 2003044680 A1 20030306, 21 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-939345 20010824.

AB A carbonyl arom. polymer electrode material, suitable for use as both pos. and neg. electrodes in elec. storage devices, is disclosed. The polymers contain at least one unit having at least one cyclopentanone structure condensed with at least two arom. rings. Exemplary carbonyl arom. polymers include polymers contg. units of 9-fluorenone, cyclopenta[def]fluorene-4,8-dione, and benzo[b]fluoren-11-one. The carbonyl structure in the polymers make them very effective electrode materials which can also be anion or cation doped to increase their performance further. In addn., the polymers are proton or hydroxide anion mediators which makes them also suitable for use in electrodes in **fuel cells**
.

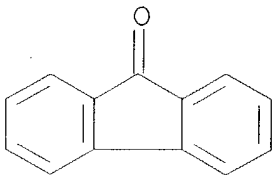
IT **500149-96-2**, 9H-Fluoren-9-one homopolymer
(polymer materials for use in electrode for use in elec. energy-generating or -storing devices)

RN 500149-96-2 HCAPLUS

CN 9H-Fluoren-9-one, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 486-25-9
CMF C13 H8 O



IC ICM H01M004-60
ICS H01M004-86; H01G009-042
NCL 429213000; 429043000; 361516000; 361532000
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76
ST **battery** electrode polymer material; **fuel cell** electrode polymer material; capacitor electrode polymer material
IT **Battery** electrodes
Capacitor electrodes
Fuel cell electrodes
Secondary batteries
(polymer materials for use in electrode for use in elec. energy-generating or -storing devices)
IT **500149-96-2**, 9H-Fluoren-9-one homopolymer 500149-97-3, Poly(Cyclopenta[def]fluorene-4,8-dione) 500149-98-4, Poly(benzo[b]fluoren-11-one) 500149-99-5, Poly(Dibenzo[b,h]fluoren-12-one) 500150-00-5, Poly(4H-Cyclopenta[def]phenanthren-4-one) 500150-02-7 500150-03-8, Poly(Indeno[1,2-b]fluorene-6,12-dione)
(polymer materials for use in electrode for use in elec. energy-generating or -storing devices)

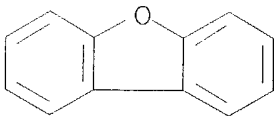
L57 ANSWER 4 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN
2002:871625 Document No. 138:124937 Influence of additives in electrolyte solutions on safety and cycle life of lithium cells. Tobishima, Shin-ichi; Ogino, Yoshihiko; Watanabe, Yu (Department of Chemistry, Faculty of Engineering, Gunma University, 1-5-1-Tenjin-cho, Kiryu, Gunma, 376-8515, Japan). Electrochemistry (Tokyo, Japan), 70(11), 875-879 (Japanese) **2002**. CODEN: EECTFA. ISSN: 1344-3542. Publisher: Electrochemical Society of Japan.
AB The influence of additives in electrolyte solns. on overcharge tolerance and cycle life of rechargeable lithium cells is examd. The electrolyte soln. employed in this work was 1M LiClO4-propylene carbonate. The additives we studied were 10 org. arom. compds. Biphenyl is well-known as an overcharge protection additive. The purpose of this work was to find additives with higher oxidn. potential and longer charge-discharge cycle life than biphenyl.

Summarizing the results, cyclohexylbenzene and dodecahydrodibenzofuran exhibited better performance than biphenyl.

IT **132-64-9**, Dibenzofuran
(additive; influence of additives in electrolyte solns. on safety and cycle life of lithium **batteries**)

RN 132-64-9 HCAPLUS

CN Dibenzofuran (8CI, 9CI) (CA INDEX NAME)



CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)

ST electrolyte additive lithium **battery** safety

IT **Battery** electrolytes
Secondary batteries
(influence of additives in electrolyte solns. on safety and cycle life of lithium **batteries**)

IT 84-15-1, o-Terphenyl 91-20-3, Naphthalene, uses 91-64-5, Coumarin 92-52-4, Biphenyl, uses 119-64-2, Tetrahydronaphthalene 120-51-4, Benzyl benzoate **132-64-9**, Dibenzofuran 827-52-1, Cyclohexylbenzene 3842-58-8, p-Cyclohexylbiphenyl 13054-98-3
(additive; influence of additives in electrolyte solns. on safety and cycle life of lithium **batteries**)

IT 108-32-7, Propylene carbonate
(electrolyte contg.; influence of additives in electrolyte solns. on safety and cycle life of lithium **batteries**)

IT 7791-03-9, Lithium perchlorate
(electrolyte; influence of additives in electrolyte solns. on safety and cycle life of lithium **batteries**)

L57 ANSWER 5 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN

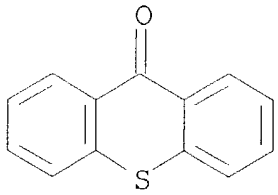
2002:595200 Document No. 137:143066 A multi-layered, UV-cured polymer electrolyte for lithium **secondary battery**. Yun, Kyung-Suk; Cho, Byung-Won; Cho, Won-Il; Kim, Hyung-Sun; Kim, Un-Sek; Rhee, Hee-Woo; Kim, Yong-Tae (Korea Institute of Science and Technology, S. Korea). PCT Int. Appl. WO 2002061874 A1 **20020808**, 40 pp. DESIGNATED STATES: W: JP, KR, US. (English). CODEN: PIXXD2. APPLICATION: WO 2001-KR133 20010131.

AB The present invention relates to a multi-layered, UV-cured polymer electrolyte and lithium **secondary battery** comprising the same, wherein the polymer electrolyte comprises: (A) a separator layer formed of polymer electrolyte, PP, PE, PVdF or

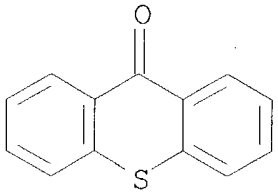
non-woven fabric, wherein the separator layer having two surfaces; (B) at least one gelled polymer electrolyte layer located on at least one surface of the separator layer comprising: (a) polymer obtained by curing ethyleneglycoldi(meth)acrylate oligomer of the formula by UV irradn.: CH2=CR1COO(CH2CH2O)nCOCR2=CH2 wherein, R1 and R2 are independently hydrogen or Me group, and n is a integer of 3-20; and (b) at least one polymer selected from the group consisting of PVdF-based polymer, PAN-based polymer, PMMA-based polymer and PVC-based polymer; and (C) org. electrolyte soln. in which lithium salt is dissolved in a solvent.

IT **492-22-8**, Thioxanthone **72896-34-5**, Chlorothioxanthone **75081-21-9**, Isopropyl thioxanthone
(UV curing initiator; multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)

RN 492-22-8 HCAPLUS
CN 9H-Thioxanthen-9-one (9CI) (CA INDEX NAME)

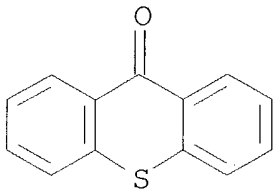


RN 72896-34-5 HCAPLUS
CN 9H-Thioxanthen-9-one, chloro- (9CI) (CA INDEX NAME)



D1—Cl

RN 75081-21-9 HCAPLUS
CN 9H-Thioxanthen-9-one, (1-methylethyl)- (9CI) (CA INDEX NAME)



D1—Pr-i

IC ICM H01M010-40
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST lithium **secondary battery** UV cured polymer electrolyte
IT **Secondary batteries**
(lithium; multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)
IT **Battery** electrolytes
Polymer electrolytes
(multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)
IT Coke
Fluoropolymers, uses
Polymer blends
(multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)
IT Crosslinking
(photochem.; multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)
IT Fluoropolymers, uses
Polymers, uses
(porous filler; multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)
IT Lithium alloy, base
(multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)
IT 102-71-6, Triethanolamine, uses 102-82-9, Tributylamine 103-83-3, n-Benzyldimethylamine 121-44-8, Triethylamine, uses
(UV curing accelerator; multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)
IT 84-51-5, 2-EthylAnthraquinone 84-65-1, Anthraquinone 93-97-0, Benzoyl benzoate 119-61-9, Benzophenone, uses 120-51-4, Benzyl benzoate 131-09-9, 2-ChloroAnthraquinone **492-22-8**, Thioxanthone 574-09-4, Ethyl benzoin ether 947-19-3,

1-Hydroxycyclohexyl phenyl ketone 2648-61-5 3524-62-7 5293-97-0, 2,2'-Dichlorobenzophenone 6175-45-7, 2,2-Diethoxyacetophenone 6652-28-4, Isopropyl benzoin ether 6652-29-5, Benzoin phenyl ether 7473-98-5, 2-Hydroxy-2-methyl-1-phenylpropane-1-one 7624-24-0 7727-54-0, Ammonium persulfate 24650-42-8, 2,2-Dimethoxy-2-phenylacetophenone **72896-34-5**, Chlorothioxanthone **75081-21-9**, Isopropyl thioxanthone
(UV curing initiator; multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)

IT 7440-44-0, Carbon, uses
(hard; multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)

IT 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 79-20-9, Methyl acetate 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 127-19-5, Dimethyl acetamide 141-78-6, Ethyl acetate, uses 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 1314-62-1, Vanadium pentoxide, uses 1332-29-2, Tin oxide 4437-85-8, Butylene carbonate 7439-93-2, Lithium, uses 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 9002-86-2, Polyvinyl chloride 9002-88-4, Polyethylene 9003-00-3, Acrylonitrile-vinyl chloride copolymer 9003-07-0, Polypropylene 9010-88-2, Ethyl acrylate-methyl methacrylate copolymer 9011-14-7, Pmma 9011-17-0, Kynar 2801 9056-77-3, Poly(ethylene glycol methacrylate) 12031-65-1, Lithium nickel oxide linio2 12037-42-2, Vanadium oxide v6o13 12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 24937-79-9, Pvdf 24968-79-4, Acrylonitrile-methylacrylate copolymer 25014-41-9, Polyacrylonitrile 25086-15-1, Methacrylic acid-methyl methacrylate copolymer 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6 162004-08-2, Cobalt lithium nickel oxide colinio2
(multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)

IT 554-13-2 1304-28-5, Baria, uses 1309-48-4, Magnesia, uses 1310-65-2, Lithium hydroxide (Li(OH)) 1313-59-3, Sodium oxide, uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 7789-24-4, Lithium fluoride, uses 9002-84-0, Ptfe 12003-67-7, Aluminum lithium oxide allio2 12047-27-7, Barium titanium oxide batio3, uses 12057-24-8, Lithia, uses 13463-67-7, Titania, uses 26134-62-3, Lithium nitride (Li3N)
(porous filler; multilayered, UV-cured polymer electrolyte for lithium **secondary battery**)

L57 ANSWER 6 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN

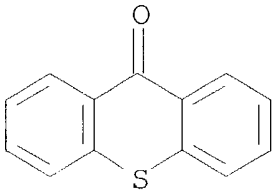
2002:595199 Document No. 137:143065 Fabrication of lithium **secondary battery** with a UV-cured multi-component polymer blend electrolyte. Cho, Byung-Won; Cho, Won-Il; Kim, Hyung-Sun; Kim, Un-Sek; Rhee, Hee-Woo; Kim, Yong-Tae; Song, Min-Kyu (Korea Institute of Science and Technology, S. Korea). PCT Int. Appl. WO 2002061873 A1 **20020808**, 35 pp. DESIGNATED STATES: W: JP, KR, US. (English). CODEN: PIXXD2. APPLICATION: WO 2001-KR130 20010131.

AB The present invention relates to a UV-cured multi-component polymer blend electrolyte, lithium **secondary battery** and their fabrication method, wherein the UV-cured multi-component polymer blend electrolyte, comprises: (A) function-I polymer obtained by curing ethylene glycol dimethacrylate oligomer of formula by UV irradn., CH2=CR1COO(CH2CH2O)nCOCR2=CH2 wherein, R1 and R2 are independently a hydrogen or Me group, and n is an integer of 3-20; (B) function-II polymer selected from the group consisting of PAN-based polymer, PMMA-based polymer and mixts. thereof; (C) function-III polymer selected from the group consisting of PVdF-based polymer, PVC-based polymer and mixts. thereof; and (D) org. electrolyte soln. in which lithium salt is dissolved in a solvent.

IT **492-22-8**, Thioxanthone **72896-34-5**, Chlorothioxanthone **75081-21-9**, Isopropyl thioxanthone
(UV curing initiator; fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)

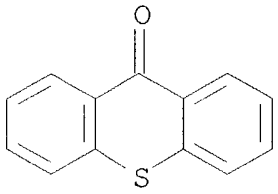
RN 492-22-8 HCAPLUS

CN 9H-Thioxanthen-9-one (9CI) (CA INDEX NAME)



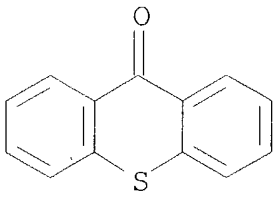
RN 72896-34-5 HCAPLUS

CN 9H-Thioxanthen-9-one, chloro- (9CI) (CA INDEX NAME)



D1—Cl

RN 75081-21-9 HCAPLUS
CN 9H-Thioxanthen-9-one, (1-methylethyl)- (9CI) (CA INDEX NAME)



D1—Pr-i

IC ICM H01M010-40
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST lithium **secondary battery** fabrication UV cured polymer blend electrolyte
IT **Battery** electrolytes
Polymer electrolytes
(fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)
IT Coke
Polymer blends
(fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)
IT Polymers, uses
(fillers; fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)
IT **Secondary batteries**
(lithium; fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend

electrolyte)
IT Crosslinking
(photochem.; fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)
IT Fluoropolymers, uses
(porous filler; fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)
IT Lithium alloy, base
(fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)
IT 84-51-5, 2-EthylAnthraquinone 84-65-1, Anthraquinone 93-97-0, Benzoyl benzoate 119-61-9, Benzophenone, uses 120-51-4, Benzyl benzoate 131-09-9, 2-Chloroanthraquinone **492-22-8**, Thioxanthone 574-09-4, Ethyl benzoin ether 947-19-3, 1-Hydroxycyclohexyl phenyl ketone 2648-61-5 5293-97-0, 2,2'-Dichlorobenzophenone 6175-45-7, 2,2-Diethoxyacetophenone 6652-29-5, Benzoin phenyl ether 7473-98-5, 2-Hydroxy-2-methyl-1-phenylpropane-1-one 7624-24-0 7727-54-0, Ammonium persulfate 24650-42-8, 2,2-Dimethoxy-2-phenylacetophenone **72896-34-5**, Chlorothioxanthone **75081-21-9**, Isopropyl thioxanthone
(UV curing initiator; fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)
IT 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 79-20-9, Methyl acetate 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 127-19-5, Dimethyl acetamide 141-78-6, Ethyl acetate, uses 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 1314-62-1, Vanadia, uses 1332-29-2, Tin oxide 4437-85-8, Butylene carbonate 7439-93-2, Lithium, uses 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 9002-86-2, Polyvinyl chloride 9003-00-3, Acrylonitrile-vinyl chloride copolymer 9010-88-2, Ethyl acrylate-methyl methacrylate copolymer 9011-14-7, Pmma 9011-17-0, Kynar 2801 12031-65-1, Lithium nickel oxide linio2 12037-42-2, Vanadium oxidev6o13 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 24968-79-4, Acrylonitrile-methylacrylate copolymer 25014-41-9, Polyacrylonitrile 25086-15-1, Methacrylic acid-methyl methacrylate copolymer 26570-48-9, Polyethylene glycol diacrylate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6 162004-08-2, Cobalt lithium nickel oxide colinio2
(fabrication of lithium **secondary battery**

with UV-cured multi-component polymer blend electrolyte)

IT 7440-44-0, Carbon, uses
(hard; fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)

IT 554-13-2 1304-28-5, Barium oxide (BaO), uses 1309-48-4, Magnesium oxide (MgO), uses 1310-65-2, Lithium hydroxide (Li(OH)) 1313-59-3, Sodium oxide (Na2O), uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 7789-24-4, Lithium fluoride, uses 9002-84-0, Ptfe 12003-67-7, Aluminum lithium oxide allio2 12047-27-7, Barium titanium oxide batio3, uses 12057-24-8, Lithia, uses 13463-67-7, Titania, uses 26134-62-3, Lithium nitride (Li3N)
(porous filler; fabrication of lithium **secondary battery** with UV-cured multi-component polymer blend electrolyte)

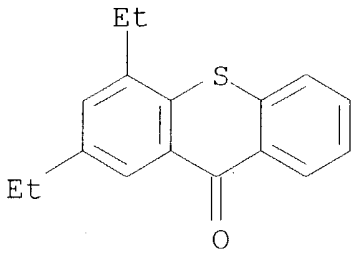
L57 ANSWER 7 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN
2000:830022 Document No. 134:19353 Manufacture of powdered microcapsules in printing ink or coating film for material for checking electromotive force. Yamaguchi, Norihiro (Sakura Color Products Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2000325776 A2 **20001128**, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-62022 20000307. PRIORITY: JP 1999-66442 19990312; JP 1999-66626 19990312.

AB The powd. microcapsules are manufd. by the process involving dispersing of an aq. soln. contg. an anionic water-sol. polymer in a hydrophobic medium, forming a microcapsule slurry by adding amine-aldehyde resin into the soln. so that a resin film is grown on the hydrophobic material surface, and treating the microcapsules, obtained after removal of the aq. medium from the slurry, with a surfactant. The aq. medium is removed from the slurry to give the powd. microcapsules contg. ≤0.01% of the anionic water-sol. polymer. The obtained powd. microcapsules, showing aggregation prevention, are dispersed in an oil medium to give the printing ink. A reversibly thermochromic substance may be the core of the microcapsules, which is contained in the coating film. The material for checking emf. of **batteries** involves a substrate, an elec. conductive layer, and a thermochromic coating layer contg. the microcapsules.

IT **82799-44-8**, 2,4-Diethylthioxanthone
(printing ink contg.; manuf. of powd. microcapsules by encapsulation of core by hydrophobic material in aq. medium followed by surface treatment with surfactant for)

RN 82799-44-8 HCAPLUS

CN 9H-Thioxanthen-9-one, 2,4-diethyl- (9CI) (CA INDEX NAME)



IC ICM B01J013-18
ICS B41M005-26; B41M005-28; C09D011-02
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 42, 46
ST powd microcapsule thermochromic core emf **battery**; coating material microcapsule dispersion emf checking; printing ink powd microcapsule dispersion; surfactant surface treatment microcapsule aggregation prevention
IT Primary **batteries**
Secondary batteries
(manuf. of powd. microcapsules contg. thermochromic core for checking of emf. of)
IT Thermochromic materials
(manuf. of powd. microcapsules contg. thermochromic core for checking of emf. of **batteries**)
IT **82799-44-8**, 2,4-Diethylthioxanthone
(printing ink contg.; manuf. of powd. microcapsules by encapsulation of core by hydrophobic material in aq. medium followed by surface treatment with surfactant for)

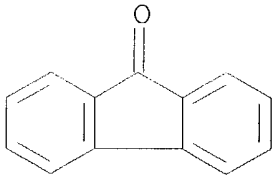
L57 ANSWER 8 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN
1998:106261 Document No. 128:182588 Carbonaceous materials for lithium **secondary battery** anodes, their preparation from coal or petroleum derivatives, and same **batteries**.
Yamaguchi, Chiharu; Okimi, Katsuhide; Takesaki, Kazuhiro; Mizutori, Shigeshi; Matsui, Kyuji (Osaka Gas Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10040913 A2 **19980213** Heisei, 8 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-194503 19960724.
AB Coal or petroleum derivs. are treated by crosslinking, adding P compds., and firing for carbonization to give the title carbonaceous materials showing isotropic structure. Preferably, fluorene derivs. and acid compds. are also added with the P compds. Preferable (A) cavity index (CI; index which is based on rate of cavity in carbonaceous material and is detd. from true relative d., crystallite size of Lc and La, and lattice const. of both the actual carbonaceous materials and theor. graphite) of the carbonaceous

materials and (B) form of P compds. in the carbonaceous materials are also described. Li **batteries** using the anodes are also claimed. Since the P compds., fluorene derivs., and acid compds. have cavity rate-increasing effects during carbonization of the coal or petroleum derivs., the prepd. carbonaceous materials show improved Li adsorbability, and the **batteries** show high discharge capacity and discharge rate.

IT **486-25-9,** Fluorenone
(cavity-increasing agent; in crosslinking treatment and carbonization of coal or petroleum derivs. for prepn. of carbonaceous materials for Li **secondary battery** anodes)

RN 486-25-9 HCAPLUS

CN 9H-Fluoren-9-one (9CI) (CA INDEX NAME)



IC ICM H01M004-58
ICS C01B031-02; D01F009-145; H01M004-02; H01M010-40

CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 51, 57

ST **battery** anode coal tar carbonization graphitization; pitch tar carbonization graphite **battery** anode; carbonaceous material lithium **battery** anode

IT Carbon fibers, uses
(carbonaceous materials as Li **secondary battery** anodes prepd. by crosslinking treatment and carbonization of coal or petroleum derivs.)

IT Carbonization
Graphitization
(coal or petroleum derivs.; crosslinking treatment and carbonization of coal or petroleum derivs. for prepn. of carbonaceous materials for Li **secondary battery** anodes)

IT **Battery** anodes
Coal tar pitch
(crosslinking treatment and carbonization of coal or petroleum derivs. for prepn. of carbonaceous materials for Li **secondary battery** anodes)

IT Coal tar

(crosslinking treatment and carbonization of coal or petroleum derivs. for prepn. of carbonaceous materials for Li **secondary battery** anodes)

IT 7782-42-5P, Graphite, uses
(carbonaceous materials as Li **secondary battery** anodes prepd. by crosslinking treatment and carbonization of coal or petroleum derivs.)

IT 104-15-4, p-Toluenesulfonic acid, uses **486-25-9**, Fluorenone 1314-56-3, Phosphorus oxide (p2o5), uses 117344-32-8
(cavity-increasing agent; in crosslinking treatment and carbonization of coal or petroleum derivs. for prepn. of carbonaceous materials for Li **secondary battery** anodes)

IT 115-86-6 603-35-0, Triphenylphosphine, formation (nonpreparative) 791-28-6 838-85-7 1707-03-5 7723-14-0, Phosphorus, formation (nonpreparative)
(in carbonaceous materials as Li **secondary battery** anodes prepd. by crosslinking treatment and carbonization of coal or petroleum derivs.)

L57 ANSWER 9 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN

1995:258064 Document No. 122:159926 Acid catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone. Wermeckes, Bernd; Beck, Fritz (Univ. Duisburg, Duisburg, D-47057, Germany). Denki Kagaku oyobi Kogyo Butsuri Kagaku, 62(12), 1202-5 (English) **1994**. CODEN: DKOKAZ. ISSN: 0366-9297.

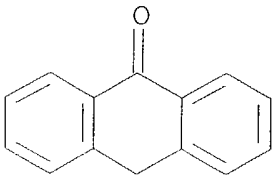
AB The reversible org. redox couple anthraquinone/anthrahydroquinone is of considerable interest for an application in metal-free rechargeable **batteries**, mainly in acid electrolytes, e.g. in aq. sulfuric acid. But the anthrahydroquinone undergoes an acid-catalyzed disproportionation reaction to yield anthraquinone and anthrone. The dependency of this irreversible 2nd order side reaction on the type of the acid, the acid concn. and the solvent was investigated by kinetic measurements in homogeneous solns.

aq. sulfuric

IT **90-44-8**, Anthrone
(acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

RN 90-44-8 HCAPLUS

CN 9(10H)-Anthracenone (9CI) (CA INDEX NAME)



CC 22-7 (Physical Organic Chemistry)
Section cross-reference(s): 25, **52**, **72**

ST anthrahydroquinone acid catalyzed disproportionation kinetics; anthrone formation acid solvent; **battery** anthraquinone acid catalyzed disproportionation

IT Disproportionation
Kinetics of disproportionation
Solvent effect
Substituent effect
(acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

IT Acids, uses
(acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

IT Disproportionation catalysts
(acids; acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

IT **Batteries, secondary**
(metal-free; acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

IT 7664-93-9, Sulfuric acid, uses 16872-11-0, Hydrogen tetrafluoroborate 30664-12-1, Hydrogen fluoride (H2F2)
(acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

IT **90-44-8**, Anthrone
(acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

IT 4981-66-2P, Anthrahydroquinone 7218-32-8P 16267-71-3P 51348-09-5P, Anthrahydroquinone sodium salt
(acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

IT 84-48-0P, Anthraquinone-2-sulfonic acid 84-65-1P, Anthraquinone

131-08-8P, Anthraquinone-2-sulfonic acid sodium salt
(acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

IT 64-19-7, Acetic acid, uses 75-05-8, Acetonitrile, uses 108-24-7, Acetic anhydride 7732-18-5, Water, uses
(solvent effect; acid-catalyzed disproportionation of anthrahydroquinone to anthraquinone and anthrone in relation to application to **batteries**)

L57 ANSWER 10 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN
1994:275415 Document No. 120:275415 **Secondary** lithium **batteries** containing polymer electrolytes. Kubota, Tadahiko; Yasunami, Shoichiro; Maekawa, Yukio; Giaume, Murielle; Leclerc, Michel; Gay, Nadine; Gagnon, Jean; Bobillier, Pierre (Fuji Photo Film Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 06029043 A2 **19940204** Heisei, 27 pp. (Japanese). CODEN: JKXXAF.
APPLICATION: JP 1992-183955 19920710.

AB The **batteries** use an alkali metal salt electrolyte soln. and a porous separator coated with a polymer electrolyte, which is a copolymers contg. a 1st ethylenic monomer having side chains of nonpolar group bonded ester or amide or polymd. nonpolar groups 0-95; a 2nd ethylenic monomer having side chains of polar group bonded ester or amide or polymd. cyano group contg. monomers 5-95; a 3rd monomer contg. ≥2 ethylenic unsatn. and ≥1 side chain 1-20; a 4th ethylenic monomer having crosslink-able side chain 1-80, and a 5th ethylenic monomer having a side chain capable of absorbing or dissolving Li 1-80 mol.%. The Li adsorbing or dissolving group is preferably a heterocyclic compd., condensed ring arom. compd., or a redox-able compd. These **batteries** have long cycle life and do not form dendrites.

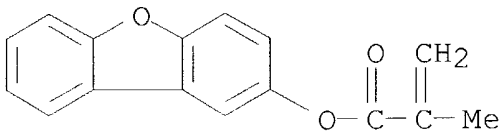
IT **154821-37-1**
(electrolyte, separators coated with, for **secondary** lithium **batteries**)

RN 154821-37-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 1,2-ethanediyl ester, polymer with 2-dibenzofuranyl 2-methyl-2-propenoate, α-(2-methyl-1-oxo-2-propenyl)-ω-methoxypoly(oxy-1,2-ethanediyl), oxiranylmethyl 2-methyl-2-propenoate and phenylmethyl 2-methyl-2-propenoate (9CI) (CA INDEX NAME)

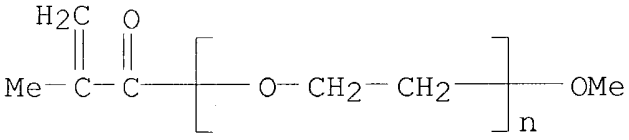
CM 1

CRN 134170-58-4
CMF C16 H12 O3



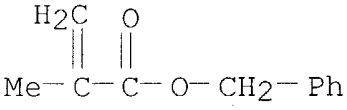
CM 2

CRN 26915-72-0
CMF (C2 H4 O)n C5 H8 O2
CCI PMS



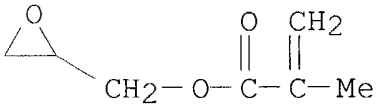
CM 3

CRN 2495-37-6
CMF C11 H12 O2



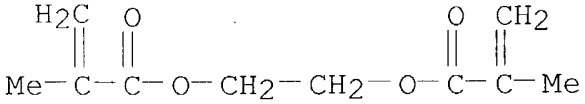
CM 4

CRN 106-91-2
CMF C7 H10 O3



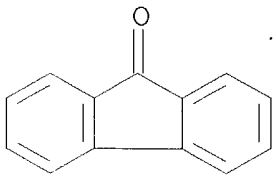
CM 5

CRN 97-90-5
CMF C10 H14 O4



IC ICM H01M010-40
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST lithium **battery** vinyl polymer electrolyte
IT **Batteries, secondary**
(lithium, long cycle life)
IT **Battery** electrolytes
(polymer, separators coated with, **secondary** lithium **batteries** contg. alkali metal salt electrolyte solns. and)
IT **Batteries, secondary**
(separators, with polymer electrolyte coatings, for lithium **batteries**)
IT 154821-32-6 154821-33-7 154821-34-8 154821-35-9 154821-36-0
154821-37-1 154821-38-2 154821-40-6 154821-42-8
(electrolyte, separators coated with, for **secondary** lithium **batteries**)

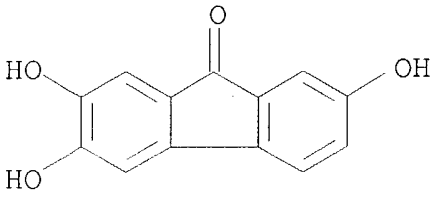
L57 ANSWER 11 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN
1987:537656 Document No. 107:137656 Electrolyte for **secondary** lithium **batteries.** Goto, Fumio; Abe, Katsuji (Toyota Central Research and Development Laboratories, Inc., Japan). Jpn. Kokai Tokkyo Koho JP 62086673 A2 **19870421** Showa, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1985-227546 19851011.
AB The electrolytes contain Li salts and an org. compd. having benzene ring and carbonyl group, which increases the charge-discharge efficiencies and extends the **battery** cycle life. These advantages were demonstrated with a Li test **battery** with 0.5M di-Ph carbonate and 1.0M LiClO4 in propylene carbonate electrolyte.
IT **486-25-9,** 9-Fluorenone
(electrolyte additive, for lithium **batteries** of high efficiency and cycle life)
RN 486-25-9 HCAPLUS
CN 9H-Fluoren-9-one (9CI) (CA INDEX NAME)



X=CO
Y=Single bond

IC ICM H01M010-40
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** lithium electrolyte additive; diphenyl carbonate lithium **battery** electrolyte
IT **Batteries, secondary**
(lithium, with electrolyte contg. additive having benzene ring and carbon group, for high efficiency and cycle life)
IT 93-99-2, Phenyl benzoate 102-04-5, Dibenzylketone 102-09-0, Diphenyl carbonate 119-61-9, Benzophenone, uses and miscellaneous **486-25-9**, 9-Fluorenone 611-97-2, 4,4'-Dimethylbenzophenone
(electrolyte additive, for lithium **batteries** of high efficiency and cycle life)

L57 ANSWER 12 OF 12 HCAPLUS COPYRIGHT 2004 ACS on STN
1984:195110 Document No. 100:195110 Zinc anodes for **secondary** alkaline **batteries**. (Toyota Central Research and Development Laboratories, Inc., Japan). Jpn. Kokai Tokkyo Koho JP 58178956 A2 **19831020** Showa, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1982-62038 19820414.
AB The title anodes are prepd. with an active ingredient of Zn, ZnO, a Zn complexing agent (Zn collector) ,and a binder. A possible complexing agent is 2,3,7-trihydroxyfluorone [**89595-14-2**]. Thus,an active ingredient contg. a Zn complexing agent was filled into a stainless steel mesh to prep. a Zn anode for a Ni-Zn **battery**. The **battery** had high discharge properties.
IT **89595-14-2**
(anodes contg., zinc, **battery**, high discharge-property)
RN 89595-14-2 HCAPLUS
CN 9H-Fluoren-9-one, 2,3,7-trihydroxy- (9CI) (CA INDEX NAME)



IC H01M004-42; H01M004-62
CC **52-2** (Electrochemical, Radiational, and Thermal Energy Technology)
ST zinc **battery** anode fluorone deriv
IT Anodes
(**battery**, zinc, contg. fluorone derivs., high discharge-property)
IT **89595-14-2**
(anodes contg., zinc, **battery**, high discharge-property)
IT 7440-66-6, uses and miscellaneous
(anodes, contg. fluorone derivs., **battery**, high discharge-property)

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